

ORAL HEALTH

Volume
VIII.

*Devoted to the
furtherance of
individual and
community
Health, by the
Advancement of
Dental Science
and
Practice
Published Monthly by
Oral Health Publishing Co.
Toronto.*

ORAL HEALTH

VOLUME VIII.

1918.

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Published by

ORAL HEALTH PUBLISHING CO.

Toronto, Canada.

Index---Vol. VIII., 1917

PHOTOGRAPHS.

	Page		Page
Amy, W. B., D.D.S.	92	Brooks, Clarence E., D.D.S., Toronto	110
Black, Arthur D., A.M., M.D., D.D.S., Chicago	48	Clay, John W., D.D.S., Calgary	369
Black, G. V., Monument.....	270	Coolidge, Edgar D., D.D.S., Chicago	424
Black, Green Vardiman	262	Conboy, Fred J., D.D.S., To- ronto	185, 263, 395
Canadian Army Dental Corps, Saskatchewan Unit	39	Cowling, Thomas, D.D.S., To- ronto	228
Canadian Army Dental Corps Building, Camp Borden	396	Coyne, N. S., D.D.S., Toronto.	225
C.A.D.C. Clinic, Exhibition Camp, Toronto	397	Cummer, W. E., D.D.S., To- ronto	256
C.A.D.C., North Toronto Or- thopedic Hospital	399	Ebersole, W. G., D.D.S.	431
C.A.D.C. Surgery, Camp Bor- den	401	Fiske, Vernon, D.D.S. ...	169, 476
Galley, Donald M., D.D.S., Chi- cago, Ill.	359	Gies, William J., New York...	189
Graham, Joseph S., M.B., M.R. C.S.	178	Goslee, H. J., D.D.S.	470
Johnson, C. N., M.A., Chicago, Ill.	220	Graham, Joseph S., M.B., M.R. C.S., Toronto	179
Price, Frank D., D.D.S., To- ronto	2	Habec	469
Price, Weston A., M.S., D.D.S., Cleveland	136	Hatton, Edward H., D.D.S., Chicago	499
Roberts, J. G., Captain	407	Husband, Fred C., D.D.S., To- ronto	19, 222
Smith, Arthur E., D.D.S., M.D., Chicago	438	Jarvis, Geo. C., M.D., Ashland, Ore.	24
Thompson, Lieut.-Col. W. G., A.D.D.S., M.D.D. No. 2, C.A. D.C.	394	Johnson, C. N., M.A., L.D.S., D.D.S., Chicago	271
Thompson, Lieut.-Col. W. G. Tent	396	Jones, Emory, D.D.S., Vancou- ver, B.C.	356
Woodbury, Dr. Frank, D.D.S., Halifax, N.S.	350	Macdonald, Wm. W., D.D.S., Toronto	199
		Marshall, V.C.W., Captain, To- ronto	3
		McLaughlin, Richard G., D.D.S., Toronto	242
		McLean, R. Gordon, D.D.S., Toronto	226
		McKim, H. A., D.D.S., Toronto	238 507
		Mills, Robert E., M.A., Toronto	244
		Orton, F. H., D.D.S., Minnea- polis	430
		Price, Frank D., D.D.S., Toron- to	3
		Price, Weston A., D.D.S., Clevel- land, Ohio	137
		Priestman, J. A., D.D.S., To- ronto	193
		Reid, Capt. J. H., C.A.D.C. ...	126
		Stillson, C., D.D.S., Cleveland, Ohio	54

CONTRIBUTORS.

Allan, James C., Captain, C.A. D.C., Toronto	194
Ante, I. H., D.D.S., Toronto...	10
Beach, J. W., D.D.S., Buffalo, N.Y.	473
Black, Arthur D., A.M., M.D., D.D.S., Chicago, Ill.	49
Bradley, Sydney, W., D.D.S., Ottawa, Ont.	352
Brethour, Fred G., D.D.S., To- ronto	83

INDEX—(Continued).

	Page		Page
Stillman, Paul R., D.D.S., New York	93	Law of Compensation, The ..	255
Simpson, J. F., D.D.S., Trenton	221	Medical and Dental Education in Ontario	185
Smith, Arthur E., D.D.S., M.D., Chicago, Ill.	439, 481	Mercurial Stomatitis, Prophylaxis and Treatment	126
Smith, W. C., D.D.S., Toronto.	224	Method for Retaining Bridge and Partial Dentures	473
Spaulding, W. G. L., D.D.S., Toronto	357	Nerve Blocking in Dental Practice	226
Snell, C. Alvin, D.D.S., Toronto	354	Nerve Blocking	468
Tanner, V. C. L., D.D.S., Toronto	202	O.D.S. Meeting, Report of....	238
Thoma, K. H., M.D., Boston, Mass	297	Our Introduction	253
Thomson, Major Geo. K., C.A. D.C., Halifax, N.S.	374	Our Buffalo Letter	468
Thompson, Capt. H. S., D.D.S., Moncton, N.B.	255	Preparation of Roots, Copings and Dowels	11
Thornton, A. W., D.D.S., Montreal, Que.	360	Physical and Laboratory Dentists	499
Thorpe, Burton Lee, D.D.S., St. Louis, Mo.	404	Preventive Dentistry	49
Trotter, W. Cecil, B.A., D.D.S., Toronto	248	Preventive Phases of School Dentistry	199
Webster, A. E., M.D., D.D.S., Toronto	154	Prevention of Malocclusions ..	194
Wood, Thomas, M.D., New York	377	Reading Dental Radiographs..	3
Young, J. Lowe, D.D.S., New York	307	Relation of Dental Operations and Dental Lesions	137

ORIGINAL COMMUNICATIONS.

A.D.C., Military District No. 2	395
Black Historical Exhibit, The.	354
Convention Banquet, The	224
C.D.S., and C. H. Johnson....	222
Correct The Habit	476
C.D.A., Chicago Meeting of the Class Reunion '02-'03	225
Constitution of D.D.C., Amendments to the	356
Dedication Oration, G. V. Black Memorial	360
Dental Research Committee of Canada, Report	365
Dental Educational Association, Formation of the	403
Detroit Dental Club Post Graduate Clinic	248
Discussion of Dr. Hatton's Paper	507
Effect of Time and Wear on the Human Teeth	154
Extension Lectures, Western Canada	369
Few Impressions at the Clinics at the C.D.A.	357
Horticulture for the Dentist..	83
Impressions of the Chicago Meeting	404
Is It Structure or Environment?	271

R.C.D.S. of Ontario and the War	187
Septic Foci in case of Chorea, removal of	179
School Dental Service in Toronto	245
State Dentistry	242-263
Silicate Cements	228
Surgical Aspects of School Dentistry	199
Technique of efficient application of fixed appliances in the correction of malocclusion ..	307
Toronto Dental School Staff, Easter Conference of the....	193
Traumatism due to faulty coordinating bridgework	93
Ulcerative Stomatitis	7

SELECTED ARTICLES.

A Report of Mandibular fractures from Practice and conclusions following treatment	54-112
Choose Your Food Wisely	204
Chronic Diseases of the Mouth of Interest to the Physician	297
Correct Posture — Why It Should Be Taught in Schools	25
Devitalizing Pulpals for Crowns	470
Diagnosis and Treatment of Root Canals	424
Difference Between a Trade and a Profession, The	189
Flavine—The Antiseptic	212

INDEX—(Continued).

Preparing Root Canals for Fillings	431
Scheme for a Ministry of Health in England and in Wales	31
Value of Proximal Contact, The	430
War's Emphasis on Health Education	377

MISCELLANEOUS.

Active Service Roll	40
A Correction, D.D.C.	368
Advance in School Dentistry at Vancouver	176
Advisory Committee on Cases of Alleged Malpractice	433
And He Was Drafted	258
Corrigan, Major C. A., Gazetted, D.A., Q.M.G.	86
Compulsory Health	511
Dental Inspection of Ontario Schools Recommended by Elgin County Trustees	133
Dentists Granted Leave of Absence Until Services Required	133
Dominion of Canada War Tax Oct., 1917	171
D.D.C.—Results of Examination, 1918	373
Dr Taggart Loses Suit in the U.S. District Court	292
Education and Eugenics	509
Electro Sterilization of Root Canals	511
Gunner V. D. Speer Honored..	86
Important Notice D.D.S.	344
Members of the C.A.D.C. Overseas Honored	77
Six Freshettes of the Royal College	436
Standardization of Dentistry..	376
War Burdens of Dental Manufacture	32
War Honors for Canadian Dentists	433

EDITORIALS.

Calcium Content of Saliva, The	45
Canadian Organization for Dental Research	390
Dental Practitioners' Course..	347
Effect of the War on Dental Practise, The	478
Efficiency of Dental Medicaments	173
Fill Up the High Schools.....	391
Forward Step in Ontario Dental Standards	434

Get Away	302
Importance of Deciduous Teeth, The	217
Reciprocity in Dental Licenses Between the General Medical Council and Canadian Provinces	259
Rural School Dental Inspection	517
Shake Up in the C.A.D.C.	435
State School Dentistry in New Zealand	89
Supreme Need in Dentistry, The	479
The X-Ray in Dentistry	131

EDITORIAL NOTES.

Lieut.-Col. Coghlan Honored..	132
Lieut. H. O'Rourke Recommended for V.C.	134
Request for Officers C.A.D.C. for Overseas	132
R.C.D.S. Extension Courses, Western Canada	304
School Dental Clinics in New York City	304

MULTUM IN PARVO.

Pages 44, 88, 214, 345, 388, 477.	
COMPENDIUM.	
Pages 33, 78, 123, 165, 206, 338, 408.	
.. .. .	509

OBITUARY.

Capt. R. M. Burgess, C.A.D.C., deceased	77
Callahan, Dr. J. R.	172
Capt. McNevin, deceased	134
Dr. F. S. Lodge	436
Lieut. J. J. Roberts	407
Lieut. Frederick A. Ballachey—An Appreciation	472
C. H. Johnson—Bereaved	436

SOCIETY PROCEEDINGS.

Atlanta-American Institute of Dental Teachers....	18, 125, 480
Announcement National Dental Association	240
Combined C.D.A. and N.D.A. Convention	176
Combined C.D.A. and E.D.A. Meeting.	351
Hamilton Dental Society	429
Meeting of Nova Scotia Dental Association, Provincial and Dental Board	374
National Dental Association Meeting, 1918	111

INDEX—(Continued).

	Page
Officers of Manitoba Dental Association	134
Officers of the Toronto Dental Society	176
Ontario Dental Society Convention	130
Ontario D.S. Convention—President's Address	221
Ontario Dental Society	421
Oral Hygiene Committee, O.D.S. Report	231
Oral Hygiene Committee Financial Statement	237
Prince Edward Island Dental Association	420
Those in attendance at O.D.S. Convention	240

PRO BONO PUBLICO.

Pages 43, 87, 129, 169, 216, 422, 476.

ARMY DENTISTRY.

Pages 253, 334, 385, 414.

PERSONAL.

Dr. Chant elected Mayor.

CANADIAN ARMY DENTAL CORPS.

Army Dental Fund, Military District No. 2	420
Dental Operations performed by the C.A.D.C. Overseas..	387
Draft for the C.A.D.C.A.	170
Officer's Method for Sterilization of Modelling in Compound	257
Work of the C.A.D.C.	133
Work Done in British Isles ..	387

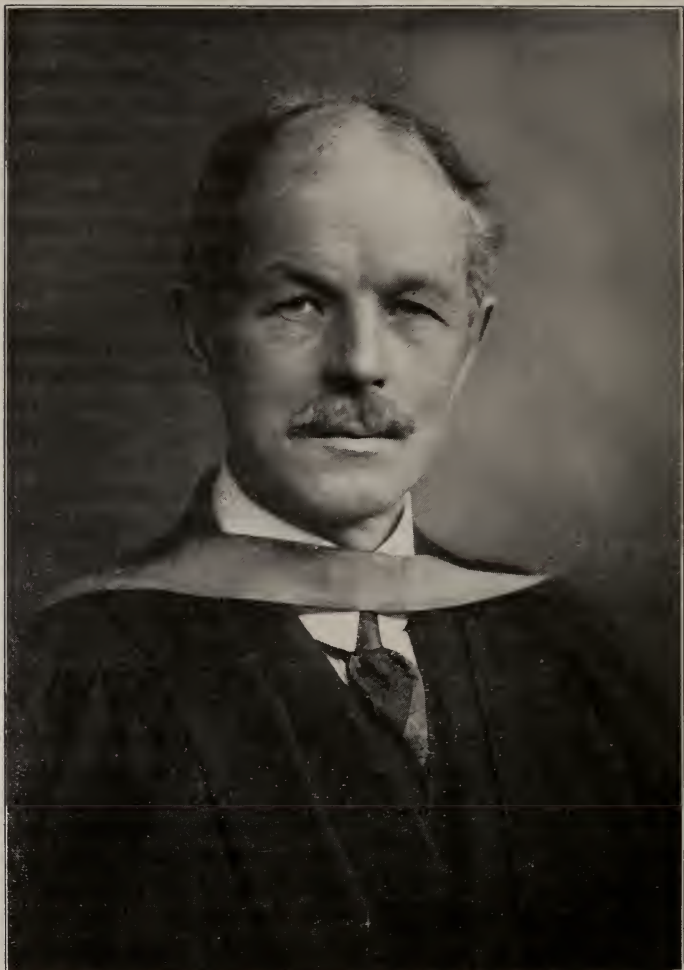
BOOK REVIEWS.

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“The Gospel of Health
According to the Dentist”

“ If it is true, believe it ;
If you believe it, teach it ;
If you teach it, the truth will
prevail.”



FRANK D. PRICE, D.D.S., TORONTO

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ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, JANUARY, 1918

No. 1

Reading Dental Radiographs

FRANK D. PRICE, D.D.S., TORONTO.

IN the August "Oral Health" appeared an article beginning with this paragraph: "The time has arrived when the dental profession will have to take a decided stand upon the whole question of radiography. Under existing conditions incalculable harm is being done to the honest, conscientious 'family dentist' who looks upon radiography as a photographic side line. What do these men care whether ethics go to the winds so long as they get a substantial dividend upon their investment in a "machine." Then appears more than two pages to amplify the above.

Quite naturally I resented the above very much as I was fairly corralled in his little ring of black sheep. Soon, however, resentment changed to pity, because the writer had poor arguments to support his statements, and I thought I saw between the lines an honest appeal for help in reading dental negatives.

Much might be said. It is a pity that so little time and practise has been afforded at the dental colleges to correct the above. Many less important subjects get more attention. The X-Ray is scientific and a faithful revealer of bone conditions and therefore worthy of being familiar to every dental student.

Many excellent dental radiographs are made in hospitals by operators who are not dentists. These men cannot be expected to correctly interpret dental negatives. The remedy should lie with the dentist. Every dentist should be able to read dental negatives. It is not often necessary, as the writer inferred, that the radiographer should know any clinical history of a particular tooth. He makes

a negative picture of that tooth and the surrounding tissues. It is often as plain to read as the print on this page. Even a poor radiograph is a great help. And no magic was ever more wonderful than the marvellous revelation often afforded by a dental negative. I have seen beauty of detail unsurpassed by any photograph. I have seen the most unexpected conditions revealed without which the tooth must have been lost or perhaps the patient's happiness, health, and often life jeopardized. And the X-Ray will be not less used, but will be used more as the weeks and years pass.

Perhaps just now we are looking most at the bone conditions about root apices. Spend time in examining your next good radiograph. We suppose it is a negative, not a print. A print is simpler to study; it is positive. But not all in a negative can be put in a print. Learn to interpret negatives. Metal in teeth show (white) in the negative. Cement shows lighter than tooth tissue. Porcelain and silicate cement are somewhat like tooth tissue. Guttapercha stops the Ray more than tooth tissue and therefore shows lighter. Enamel is denser and shows lighter than dentine inside it. The cellular structure of alveolar bone is shown beautifully. Soft gum tissue shows little, if any. The pericementum should be shown as a dark line against the root. This normally is plainer toward the neck of the tooth but should be followed about the apex of the root. Just outside the pericementum look for a light line which is the bony wall of the root socket and is shown by this light line to be compact bone. Let me emphasize the importance of looking for this light line just against and outside of the dark line made by the pericementum. This light line is never carried through a dental abscess or a granuloma. Hold your negative before an electric light strong enough to make every detail plain. The ideal light is 50 to 100 candle power with a green opal shade. Let the light shine on the film but have the shade between the light and the eyes. Surround the negative with a dark card, so the sight is not hindered by the bright light that would pass around it. Use a good magnifying glass of 10 to 15 power to see every detail. You will often follow the white socket wall toward the gingival margin and see it more or less broken into by a gingival infection. It is most interesting to study about the apical area of all dead teeth. I may offer it as a rule that whatever may appear or has been interpreted as alveolar abscess, that if the compact root socket wall can be followed about the root apex, there is no sign of apical infection. But it is comparatively rare where roots have long been dead and especially if poorly filled to find this line not broken into. I must also say that not always about healthy roots can this light line be followed. Where the root end is small and the curvature sharp, or where the tube used is of too high vacuum and too high penetration or any movement of the film during exposure, it will not be shown.

I understand that any unfilled apical portion of a dead root contains sooner or later organic matter that is suitable food for bacteria and that bacteria will get in there. Bacteria and their products will continually pass through the apical openings and there is war between the bacteria cells and the body cells, each trying to destroy and use the other. The body cells for better defence build around the bacteria infection a wall of granulation tissue, and this is the beginning of a granuloma. Within the dead root is no blood circulation, so no means of destroying the bacteria that never cease their invasions. Condition of the patient's health often permits the granulation wall to be frequently broken through by the invaders, necessitating a further outward growth of the granulation tissue which, in time, often leaves a more or less large socket about the root apex. The inside of the granulation, I understand, contains bacteria, that are more or less able to pass beyond the granuloma into the blood stream and may infect another part of the body for which they have an affinity or which offers too little resistance to destroy them. I cannot see how an unfilled apical part of the root is ever safe, but will likely sooner or later lead to the above conditions. I know that for the past year fully half of my dental practise has been treating the mouths of people who are more or less ill supposedly from oral infections. And often I have seen people relieved by dental treatment so promptly that it has reminded me of the old days of miracles.

The radiographer is often appealed to in cases of acute abscess. And if the infection be of short duration the negative may show little or nothing abnormal. The fact has been that a violent invasion of the apical area has produced first an increased blood supply, then stasis with consequent inflammatory products extending a considerable distance about the root apex. This condition may exist about a considerable area and not more acutely at the root apex than a short distance away from it. There may follow some necroses about the apex, not often. If there does, then pus would continue to flow freely. The sequestrum of alveolar bone would break into irregular masses. The living bone about the necrosed area would be jagged and irregular. The wall outside a granuloma usually presents a rounded regular outline. The patient may never have felt the presence of a granuloma which may be a cause of almost any illness.

Cotton in a root canal never shows. A paste in cotton may have somewhat the density of the tooth and make the canal difficult to show. Often a gutta percha point is put in the canal to become stopped at the neck, leaving a long thin point, often crooked, that far from fills the canal. No agent has so revealed to us the very low percentage of food root fillings as the X-Ray and has so led us to make good fillings.

There is considerable difficulty in getting negatives of the upper molar regions that clearly show the parts. The negative film is

placed inside the arch lying against the teeth and palate. Thus the film is not nearly in the same plane as the teeth, and if the arch is very low the film is nearly horizontal. The rule for the position of the tube is half way between a perpendicular to the teeth and a perpendicular to the film. Thus the tube must be placed high, so that the rays pass down through the antrum to get the palatal roots or to get beyond the apices of any posterior teeth. Very often the rays must pass through the malar bone or malar ridge, which is dense bone. All these structures must be taken into account in judging negatives of these parts. Often cells of the antrum show dark areas on the film like abscess areas.

The floor of the antrum always should show as a light line. Above this line we expect to find dark areas showing antrum cells. About the roots of healthy teeth shown against the antrum we may often follow the light line of the root socket wall, and inside it the dark line of the pericementum. An apical abscess as a rule lies about and against the root apex, and destroys the pericementum and socket wall. The antrum cell shows any accidental relation to the root apex.

Usually the patient holds the film in place by pressing a finger against it. This usually bends the film. The part of the film against the teeth may be nearly vertical and the part below the palate nearly horizontal. Thus the shadow of the tooth crown may be shortened and of the apical part very much lengthened. A film placed inside the centrals will likely be curved at each side, so that while the centrals may appear normal, the lateral roots may be shown too wide and the cuspids very much too wide. All such conditions must be recognized in the film and judgment made accordingly. This same bending of the sides of the film is sure to occur in examining the lower central region. The floor of the nares should never be mistaken for an abscess. Everybody knows where the nose is, and the dark area of the floor of the nose is usually well above the shadow of the roots. Often, however, the end of the nose or the vomer will be shown as a shadow, say, over one central root if the rays come from one side of the centre of the face. Thus the root of one central and alveolar bone about it will show much darker than the other, because the other is shadowed by the nose and vomer. Often the alveolar bone about the lateral incisor root is very thin and cancellous and the ray may be directed just at right angles to it. This often will make the part of the negative about and just above the apex of the lateral tooth so dark as to look like an abscess area. If I have any doubt of the vitality of the lateral tooth to be radiographed I usually make that fact clear by means of an electric test to avoid any mistake in reading the negative. The areas of the lower bicuspid and molars are most easy to radiograph. The inferior dental canal and the mental foramen will likely be shown and the mental fora-

men is apt to appear about the end of the second bicuspid root, the apex not being in the middle of it. Even the apical end of the root within the granuloma should appear darker than the portion of the root not within the granuloma, because alveolar bone is destroyed buccally and lingually as well as mesially and distally. In the same way upper bicuspids and molar roots that overlap and thus fall in the same line of rays from the tube will be shown lighter on the film than where roots do not so overlap. This is often the only way we can trace upper molar buccal roots and the tissue about their apices.

Perhaps, my dear Mr. Editor, this is enough for one brief article. If I can further assist anyone to get more out of his dental negatives I shall gladly do it. For nearly fifteen years I have been examining many hundreds of films every year, and he would be dense indeed who would not begin to see something with that opportunity. Thanks for your valuable space.

Ulcerative Stomatitis*

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DENTAL SERVICES.

Canadian Army Dental Corps, Overseas.

SINCE the outbreak of the present war we have heard more or less of various diseases which seem to have automatically taken on popular names, such as "Trench Feet," "Trench Fever," and "Trench Mouth." "Trench Mouth" is at its best a crude expression of a pathogenic condition of the mouth. It is impossible to trace its origin to the trenches any more than to the training camps. A suitable and standard name is difficult to find, but I think that the most expressive yet suggested is Ulcerative Stomatitis.

The object of this paper is to give a brief review of the history, symptoms, microscopy and treatment of Ulcerative Stomatitis, basing my remarks on a series of experiments I conducted on a varied range of cases, which would all be classified advanced or severe. I found that with careful treatment an average of six days was necessary to effect a cure. I cannot say that this cure is permanent as time alone can justify such a statement.

HISTORY.—Patients suffering from Ulcerative Stomatitis are found in all areas of England. Many officers and other ranks returning from France as well as many from hospitals and training camps report for treatment.

It is advisable to conduct a systematic examination of the troops.

* Published in Oral Health with consent of Director Dental Services, Canadian Army Dental Corps, Overseas.

In this way a great many cases are caught in the early stages. The cases which present themselves are usually more severe and more difficult to treat, as the patient does not report for treatment until inconvenienced by the more distressing symptoms.

The lowered vitality of the system, caused by the physical strain and the cold and dampness, together with the absence of the soldier's usual pre-war, self-selected diet makes him more liable to the action of the specific organism—if there be any one specific organism—of Ulcerative Stomatitis.

Infection is transmitted by the common use of dishes, pipes, drinking vessels, etc. This has been demonstrated by the great reduction of the number of cases where common drinking vessels and dishes have been sterilized in boiling water, and the men prohibited from smoking each other's pipes. In different officers' messes the disease has been conveyed to almost all of the members, which is significant in regard to its infectious character. The gas masks in use in the anti-gas schools are a source of transmission of infection, and it appears to be difficult to sterilize the gas-masks in a satisfactory manner.

I have treated several officers for Ulcerative Stomatitis, and have also had to treat their wives for the same disease.

A certain number of recurrent cases are found. These may be caused by fresh infection, perhaps from the patient's tooth brush, or by incomplete treatment, which may be due to lack of facilities at the hands of the Operator, lack of time, failure on the part of the patient to practise thorough prophylaxis of the mouth, or by the causing organisms being lodged in the throat. Many patients have ulcerative throats, a result of gas poisoning, which are difficult to put in a healthy condition.

SYMPTOMS.—The patient has a general feeling of lassitude, suffers from sleeplessness, and has an increased temperature.

There is an inflammation of the tissues of the mouth and often of the throat. The inflammation of the mouth is more pronounced towards the gingival margins and in the interstitial spaces. In the more severe cases the sloughing is more pronounced and may be present in irregular patches in the mouth or throat. Various glands are often enlarged and the patient usually has a foetid breath and suffers local pain.

Ulcerative Stomatitis is often combined with Pyorrhea Alveolaris, more or less severe. There may be deposits at the necks or on the roots of the teeth or there may be deep pockets combined with absorption of the alveolar process.

MICROSCOPY.—The most common organisms are Spirochaetes and Fusiform Bacilli similar to those described by Vincent.

In some cases, organisms of the Diphtheroid Group are present, especially where there is an apparent throat infection. Throat swabs from these cases often collect Diphtheroids.

In other cases we only find fields of mixed Cocci, or fields of general mixed infection, where it is difficult to recognize any predominating organism.

We have been assisted in the identification of the Diphtheroids by cultures grown on Blood Serum, in fact we have grown cultures on most of the organisms associated with Ulcerative Stomatitis, except the Spirochaetes and Fusiform Bacilli, as we have not yet found a suitable media for their propagation.

TREATMENT.—Segregation of the patients is of great assistance in the treatment, as the infection is not so liable to spread, and the complete sterilization of the dishes can be observed. It is also valuable to have the men where they can be summoned for treatment when wanted.

The diet should be observed and a good variety obtained which includes fresh vegetables and fruit. The bowels should be properly regulated.

The operator, besides having the proper appliances for diagnosis, should have at his disposal several atomizers, tongue spatulas, and a satisfactory set of scalers, with duplicates, so that complete sterilization may be obtained between each and every patient. He must also have a supply of drugs to carry out the different treatments. No set treatment is infallible in all cases as any set of records will show.

I have had the best results with a daily treatment as mentioned below.

Any deposits of the teeth are removed as soon as possible and the mouth given a general prophylaxis. The patient's tooth brush should be boiled and the following routine observed daily.

The tissues of the mouth, and particularly the infected parts, are sprayed with a saline solution or a 2 per cent. solution of Milton Fluid, which is a proprietary antiseptic made by the Milton Manufacturing Company, 125 Bunhill Row, London, E. C., 1. The manufacturers of the fluid claim it to be non-poisonous, non-irritant and non-corrosive, and I have a laboratory report to this effect on my files. From the odor of the preparation I am led to believe that it contains some percentage of chloride of lime.

The greyish membrane around and over the infected parts is wiped off with a pledget of cotton dipped in absolute Alcohol. By wiping away the friable membrane the mixture which is next used comes into direct contact with the infected tissues.

If the infected parts are confined to the mouth I spray them with a mixture which, for want of a better name, I designate "M2". This mixture is composed of equal parts of Liquor Arsenicalis, Vinum Ipecac and Aromatic Sulphuric Acid. This mixture can be safely used in the mouth, but should not be used in the throat. If the infection be in the throat I would recommend spraying with pure Liquor Arsenicalis, not using more than six or seven drops at one treatment.

(Some operators may object to the use of Aromatic Sulphuric Acid

in the mouth, fearing harmful action on the tooth tissue. This agent may be excluded from the formula and the same treatment employed, but the action on the pathogenic organisms will not be so rapid. Taking into consideration the small amount of Sulphuric Acid recommended and the short space of time during which it would be employed, I do not fear its careful use in the mouth. My experiments, conducted by suspending human teeth in both Aromatic Sulphuric Acid and the "M2" mixture for extended spaces of time, confirm my opinions as to its employment, especially so when its use shortens the treatment.)

The tissues of the infected parts are painted with Iodine. To get good results the Iodine solution should be freshly made:

Iodine crystals	1 gm.
Ethyl Alcohol	10 c.c.s.

It is necessary that the patient should cleanse the teeth thoroughly with a tooth soap containing Liquor Arsenicalis. The Director of Dental Services has recommended the following formula for a tooth soap, and has secured authority to have same made for distribution:

TOOTH SOAP.

Soap	55.00
Calcii Carbonas praecip (light)	27.00
Liq. Arsenicalis, P.B.	10.00
Pumice (fine)	4.00
Oil Eucalyptus, P.B.	2.00
Oil Peppermint, P.B.	2.00
Acrid Flavine	2-3 ozs.

The patient should also receive general dental attention, so that roots of teeth, cavities and badly fitting crowns and bridgework should not be harbingers of the causing organisms.

There are certain cases which do not yield to a standard treatment and for these, modifications may be used.

The interstitial spaces are often the last to clean up and for this condition I recommend the use of a thin paste composed of Iodoform and Liquid Paraffin. If this paste be applied to the infected parts and pressed to place with a gauze napkin it will remain there for a few hours with beneficial results.

If there is a relation between a mouth and throat infection, the latter will have to be treated in conjunction with the former. If the throat contains a Vincent's Angina or similar infection, it may be sprayed with a few drops of Liquor Arsenicalis. If Diphtheroids, Pneumococci or mixed Cocci appear to cause the throat infection, the parts may be sprayed with the following:

Sodium Desoxychlorate 1-2000	1 part,
Acrid Flavine 1-500	2 parts.

A general inflammatory Stomatitis is sometimes found. A micro-

scopic examination usually discloses a very mixed field in which it is difficult to observe any one predominating organism. These cases may be treated successfully with the Sodium Desoxychlorate and Flavine Solution.

Ulcerative Stomatitis is quite often allied with Pyorrhea Alveolaris. This necessarily complicates the treatment as the operator must combine the instrumentative treatment for Pyorrhea Alveolaris with the medicinal treatment for Ulcerative Stomatitis.

When the operator believes that he has completed a cure, it is wise to confirm his opinion with microscopic tests.

The patient should be given a new tooth brush and his old one should be destroyed. Prophylactic education should also be given to the patient so that he may the better prevent the introduction of a fresh infection.

The Preparation of Roots, Copings and Dowels

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PROSTHETIC DENTISTRY, ROYAL COLLEGE OF DENTAL
SURGEONS.

(Continued from December Number.)

THE PLATE AND DOWEL CROWN.

The plate and dowel base differs from the preceding, by the absence of a band or partial band. It consists of inserting a dowel and burnishing or swaging a thin piece of pure gold or platinum to the end of the root, which is either angular or flat. The angular base has a wide range of application, and is probably the most extensive base employed in the restoration of the upper anterior ten teeth, for single crowns.

ADVANTAGES OF THE ANGULAR BASE.

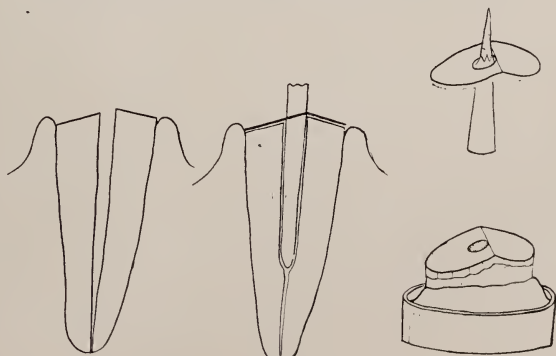


Fig. 15

(1) A close line of junction is secured between the crown, the periphery and base of the root.

- (2) The natural conditions of the gingivae is preserved.
- (3) The conservation of tooth tissue.
- (4) Greater esthetic possibilities are afforded.
- (5) It lends itself to the adaptation of almost any form of crown or facing.

(6) The angular shape of the base offers mechanical resistance to the stress imposed, and overcomes any tendency toward rotation.

With stones and root facers, as previously described, the root is beveled both lingually and labially, the enamel being allowed to remain, as no band or half band is employed.

The labial bevel extends from the lingual of the pulp canal to a point sufficiently beneath the free gum margin to allow for the thickness of the gold, and to permit the neck of the facing to pass beneath, thus making the joint invisible.

The lingual bevel extends from the lingual of the canal to a point just to, or a little above, the gum line, if the bite will permit. By so doing the joint is rendered more hygienic and self cleansing, also it is not necessary to carry it below the gum because of the absence of esthetic requirements upon this surface.

FLAT BASE.



Fig. 16



Fig. 17

While the flat base has limited use, it may be desirable for the second bicusps and molars for single crowns. These teeth usually receive vertical stress. The dowel would take care of any lateral stress that might be imposed, hence a flat base is all that is necessary.

It may also be employed on roots where the basal end has been disintegrated by caries, thus making it impossible to prepare any other form of root preparation. The basal end of the root is made flat or a gradual incline from buccal to lingual, which has been previously described.

When impossible to adapt a half band, or even burnish the gold slightly over the end of the root, a groove is cut on the basal end ex-

tending from within 1 mm. on the labial, through the canal to within the same distance on the lingual. It is made from 2 to 3 mm. wide, and about two deep at the central point which is at the canal. Fig. 16.

The advantage claimed is to prevent rotation and displacement of the coping when burnishing and subsequently cementing to place. These dangers would be attending when a flat base is employed.

THE DISADVANTAGES OF A FLAT BASE ARE:

- (1) It does not prevent rotation.
- (2) Offers no mechanical resistance.
- (3) Greater destruction of tooth tissue.
- (4) Suitable for single crowns only and not as abutments.

When the desired preparation has been secured, either flat or angular, a piece of 34-gauge pure gold or platinum should be cut to conform with the anatomical form of the root end, and a trifle larger than is necessary (2 mm.), anneal and burnish to the end of the root, insert the dowel and attach both with solder. The adapting of the coping is easily accomplished with burnishers, the soft rubber tip of a lead pencil and an automatic mallet, as previously described, with the half band coping.

The dowel and coping are placed in position on the root and re-adapted, the surplus is trimmed off, being careful not to cut too close to the peripheral line. It is advantageous to leave a very fine line of excess gold, which is trimmed off with disks when the crown is completed, thus forming an absolute flush joint.

CONCAVED ROOTS.

Fig 17

In most of these cases the root has been destroyed from disintegration or accident, and presents a rounded or funnelled, concaved surface, with irregular edges. They are imbedded beneath the gum, and because of the extreme shortness and close proximity of the end of the root to the border of the alveolar, no opportunity is afforded for the adaptation of a band or half band cap.

The gum tissue is pressed away with temporary stopping until free exposure of the end of the root is obtained. The irregular edges are ground down smooth with small mounted stones (No. 144), or root facers, all decay is removed and the remaining root disinfected, sterilized and cauterized with zinc chloride or nitrate of silver, in order to arrest any further decay.

The best means of securing a coping will depend much upon the conditions presenting. Good results may be secured by either burnishing, swaging or casting a coping to the surface and irregular edges of the root, which will offer a secure and reasonably permanent attachment.

The canal is prepared for the reception of the dowel, and same is fitted. As they are generally much shorter than usual, it is essential

that the dowel should be of adequate size, and length to thoroughly fill the canal and extend above the basal end about 4 mm.

BURNISHING.

After fitting the dowel in the canal, it is marked by scratching at a point where it extends out of the deepest portion of the canal. Trim a piece of pure gold, 36-gauge, twice the diameter of the basal end of the root, punch a hole in the centre of same, and insert the dowel up to the point where it has been previously scratched. With a small piece of solder attach the two together.

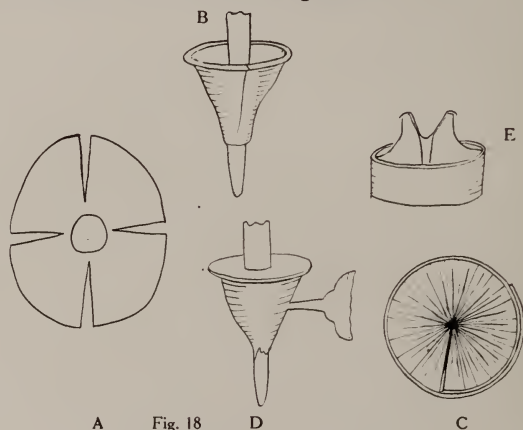


Fig. 18 A, B.

Four slits are cut in the gold at opposite angles, extending from the outer surface of the gold to within a millimeter of the dowel. The gold is given a cone or funnel-shape by lapping the edges. Insert into the root or canal and force to place. With cotton or spunk, the cone is expanded and burnished until it conforms to the shape of the canal. Remove, trim off excess, replace again, and with the automatic plugger, adapt the gold to the basal end of edge of the root. If at any point it is possible to extend the gold over the edge, up on to the root, thus forming a cap, do so, as it will give increased mechanical support. Fig. 18, A, B.

Remove, trim off excess, invest and flow solder into the concavity. Adjust to the root again and reburnish the edges close to the root end.

Another method is to trim the gold to form a round dish, with the shears make one cut from the outer edge of the gold to the centre, then lap these edges over one another, forming a funnel. Insert into the concavity of the root, force the dowel through same, remove and solder together, replace upon root, burnish and trim as described above. Fig. 18 B, C,

CASTING.

The dowel is fitted as described. A flat coping of pure gold, 34-gauge, slightly larger than the basal end of the root, is fitted flat to the end of the root. The coping is perforated, placed upon the end

of the root, and the dowel fitted to it, removed and soldered.

Inlay wax is flown upon the under surface, or root side of the coping and dowel. While the wax is quite warm press to place upon the root, remove and trim away the excess wax. Heat the wax on the dowel and coping, slightly in warm water, and refit to the root again, pressing well to place, and remove.

The sprue wire is inserted at a convenient point, invest, heat and cast with 22k. gold. The root base now consists of dowel, coping and a cast core, which fits up into the concavity. Fit to the root and with the automatic burnisher, burnish the edge of the coping to the edge of the root, overlapping the root where possible. Trim away excess, replace on root ready for the impression. Fig. 18, D.

SWAGING.

Whenever the swaging procedure may be indicated, the most careful and accurate reproduction of the conditions may be secured by first fitting a wooden dowel into the canal, then taking an impression in impression compound, contained in a metal ring or cup of suitable size, of the edges and outline of the root. Chill and remove, the wooden dowel will come away in the impression.

To obtain a die, the impression is encircled with a strip of thin wax (Ash's thin wax), which should extend over and above the wooden dowel. This is invested in soft plaster contained in a small rubber ring; imbed the impression into the plaster up to the edges of the wax, thereby forming a cup; into which when hard, quick setting amalgam or copper amalgam may be packed.

When the amalgam is set, the plaster and compound are broken away and the amalgam die is inserted into the base of some swaging device. A piece of pure gold, 34-gauge, is swaged to place and trimmed, the metal dowel is substituted for the wooden, the dowel and coping are soldered together, and then re-adapted by burnishing to the root in the mouth. Fig. 18, E.

THE SHOULDER PREPARATION.

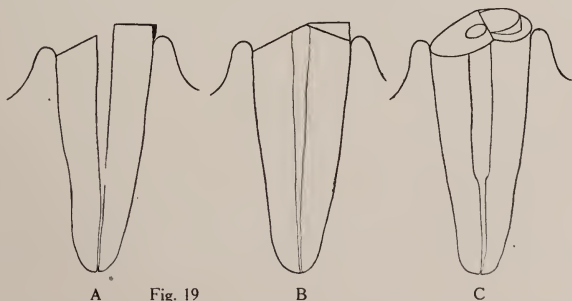


Fig. 19

The shoulder preparation differs somewhat from the preceding forms, and consists of a combination of the half band and the plate

base preparation, with a shoulder on the lingual half of the root extending from the proximal to the lingual surface. The greatest depth being on the lingual surface, and gradually tapering to nothing, at a point about the centre of the root.

It is useful when the employment of a band or half band is indicated, but seemingly undesirable, in certain classes of cases together with the advantages to be derived from this form of preparation.

It has a wide range of application and usefulness as abutments for bridges and special attachments. It may be employed on any of the teeth, except the lower anteriors.

Advantages.

(1) It secures a close abutted continuous line of junction between the coping and the root.

(2) It offers mechanical resistance to stress imposed.

(3) It prevents any possible rotation.

(4) It permits of the preservation of normal condition at the gingivae.

(5) It conserves tooth tissue.

To prepare the shoulder preparation, the regular angular half band preparation is first made as heretofore described. The plate preparation is made by cutting a groove in the lingual with a knife-edged stone, extending the groove labially about 1 mm., and upon the lingual to a point just to the gum line. Insert a small fissure bur (No. 557 or 700) into this groove, and with care guide it from the lingual around to the mesial, and then to the distal, cutting a shoulder about 1 mm. wide, even with the gum line on periphery, from the mesial around the lingual to the distal on the lingual half of the root. The coping or base is either burnished or swaged, the latter preferred.

See Fig. 19, A, B, C.

CONCAVING THE BASAL END OF ROOT ON LABIAL OR LINGUAL.

The concaving of the root end consists of cutting a concavity either on the lingual or labial half of the basal end of the root. The greatest depth being at the root canal, then extending labially, mesially and distally to the peripheral edge of the root. Fig. 20.

It is indicated on any of the teeth with root preparations to receive

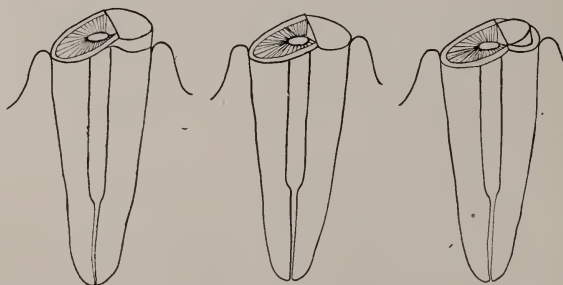


Fig. 20

full band, half band, plate and shoulder, caps or coping, which are to support a facing or porcelain crown. It is especially useful on roots, where the gum on the labial side has receded to excess, producing a long labial and a short lingual surface, Fig. 20.

Advantages.

(1) Greater opportunities for the adaptation of the facing or crown to the cap or coping, without causing undue prominence at the neck, and eliminating any display of gold.

(2) Increased mechanical retention to the root.

(3) A minimum amount of grinding of the facing or crown.

(4) A maximum of strength to the crown, by giving increased soldering possibilities and attachment between coping and dowel.

(5) Eliminates the possibility of rotation.

After deciding upon and preparing the regular root preparation, with a fissure bur in the contra angle, place it on the highest point of the root, labially to the root canal, holding the bur at right angles to the long axis of the root; cut up into the basal end of the root from 1 to 2 mm. With the bur in the same position, and a downward motion, begin to cut (mesial or distal), forming a saucer-shaped concavity on the labial half of the root. The concavity is made smooth with cone-shaped mounted stones.

In the majority of the root preparations, when a facing or porcelain crown is fitted to the base, it will invariably come directly over the dowel. This would necessitate cutting the dowel off flush with the floor thus rendering it very weak as the only attachment the dowel would have, would be to the thin floor of the coping.

By concaving the labial half of the root plenty of room is left to place the crown or facing in place without weakening the attachment of the dowel, crown or facing. With the root preparations where the labial half of the root is flat, it is necessary to grind the tooth on the ridge, lap or neck so as to produce an angular or V-shaped space in order to give sufficient room in which to flow the solder or gold. This mass of gold, being carried so near to the labial face of the tooth, renders it visible, and it will glitter and cast a dark shadow between the teeth, and also the gum, which is unsightly, especially so in anteriors.

By concaving labially the facing or crown may be ground flat or flush with the labial half of the coping, thus eliminating the gold on the mesial, distal and labial surfaces. It also eliminates grinding the porcelain to excess and thereby weakening it. More room is secured between the porcelain and the base of the root in which to flow the solder. Its increasing soldering possibilities and attachment between the coping, dowel, and the base of the porcelain, thus producing a maximum of strength to the finished crown. Fig. 21.

It also produces increased mechanical retention, and prevents rotation.

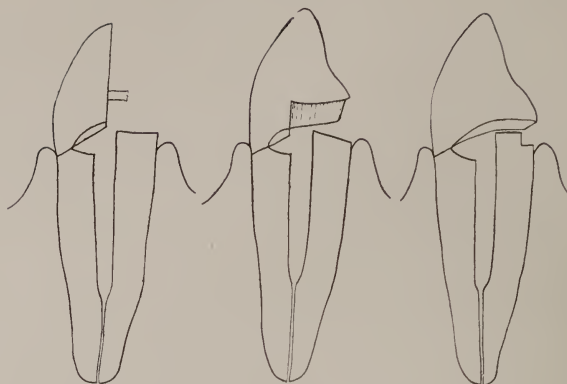


Fig. 21

On teeth with the long labial surface, when the gum has receded to excess, the root is prepared with a flat gradual incline from labial to lingual, even with the gum line. The labial one-third of the root surface is prepared so as to extend under the free margin of the gum. The lingual half of the basal end is concaved as described. When adapting the facings, the neck is fitted flush upon the labial bevel and the solder flown to the lingual of same. Fig. 22.

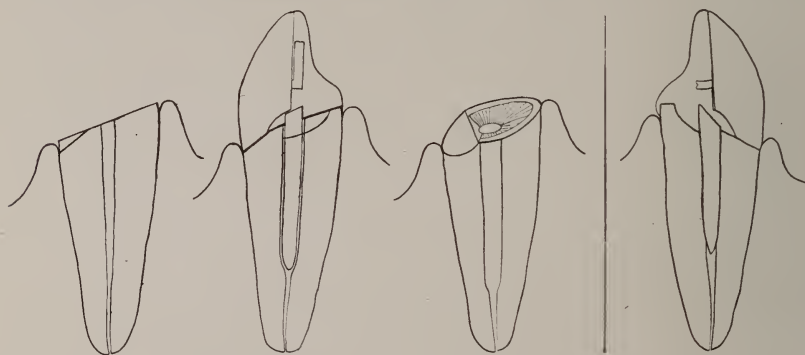


Fig. 22

Fig. 23

On lower teeth the plate coping is all that is necessary, but on uppers, if possible, a half band should be used, as the stress imposed would fracture the root. Fig. 23.

American Institute of Dental Teachers

THE next annual meeting of the American Institute of Dental Teachers, will be held at Hotel Schenley, Pittsburg, Pennsylvania, January 29, 30, 31, 1918.

The meeting as usual will be devoted to dental teaching—a number of the papers will deal with situations arising from war conditions. A cordial invitation is extended to all interested in dental teaching.

Preventive Dentistry as Presented by Russell W. Bunting, D.D.S., Toronto Dental Society, December Meeting

FRED. C. HUSBAND, D.D.S., TORONTO.

PREVENTIVE Dentistry belongs to the general scheme of Preventive Medicine. It is the department of conservation and is divided into two phases: first, to preserve the teeth, and second, to prevent tooth disease injuring the body as a whole.

Rosenow states that 90 per cent. of focal infection is found above the collar, largely in the tonsil, the sinuses and the teeth. A large percentage of these foci are found in the teeth. The teeth foci are divided into two areas; first, the periapical region, and second, gingival.

Abscesses result in practically all cases from dead pulps. If there are no dead pulps there will be, practically, no abscesses. We have no certain root canal filling excepting a live, healthy pulp. Dental caries is largely responsible for abscesses. Prevent caries and no abscesses will appear.

Pyorrhoea has its origin in gingival irritation and trauma. Mayo says that the next great step in preventive medicine is to come from dentistry. A specific organism has been looked for, but not found. We cannot attribute tuberculosis to the presence of this specific bacillus but to the cause behind it; namely, the predisposition of the patient. Miller, following Koch's method, showed that certain bacteria, acting on carbohydrates, caused acids.

In dealing with the problem of dental caries, we find a number of factors that are changeable:

FIRST—Dental caries cannot operate unless the acid is confined by a thick and viscid saliva forming a sticky mass around the teeth. Flat fillings also prevent the saliva from washing certain susceptible areas.

SECOND—White blood corpuscles find their way to the saliva and are known as antibodies. Some work is being done in Battle Creek along these lines.

THIRD—Foods such as sugar, pastry, and meats show certain action on dental caries.

FOURTH—Potassium sulphocyanate (K.C.N.S.) is always found in saliva—in low concentration in some mouths, and in others in high concentration—and is regarded as an index to immunity or susceptibility according as it is high or low. We do not hear now of the K.C.N.S. test.

FIFTH—Acids or alkalis, as shown by the Litmus test, are regarded as factors. Some manufacturers put acid tooth dentifrices on the market supposing the acid to stimulate the flow of alkaline saliva.

In examining hundreds of samples of saliva it is found that one cannot tell anything of its acid or alkaline quality. Some of the salts being combined with colloids and mucins in physiological chemical union. The method of applying heat to drive out these colloids was found to destroy the original saliva. Saliva is an amphoteric compound that is at once acid and alkaline, and will take up and unite with an acid and an alkaline at the same time.

Marshall, of the University of California, has made tests on this amphoteric quality of saliva.

He adds the *basic* titration of a sample of "resting" saliva to the *acid* titration of the same sample and divides the result by the *basic* titration of a sample of saliva stimulated by chewing paraffin added to the *acid* titration of the same sample, the quotient being the guide to immunity or susceptibility. He claimed that a patient showing a result of 80 per cent. or less was immune, while one showing over 80 per cent. was susceptible. Gies, of Columbia University, claims to have proved the inaccuracy of this method.

It has been found that chewing an inert substance like paraffin will give a re-action and produce an increase in both the acidity and alkalinity of the saliva.

Pickerell used potassium tartarate to stimulate alkaline saliva; Gies, of Columbia University, used vinegar for the same purpose. None of these things seem to be a solution of the problem of caries by the evidence brought forward to date.

DR. BUNTING'S OWN TESTS.

There are two general classes of teeth,—the soft tooth and the firm, hard tooth. In every case where teeth were hard more calcium was found to be present in the saliva. Where the teeth were soft the calcium content was found to be low, and this condition almost never varied. Calcium was fed to a patient low in calcium content, but with no results. In maternity cases the calcium content was found to be low and in the last months to drop off to almost nothing..

The tooth is porous and an interchange of fluids through the tooth substance has been shown, by tests, to take place, due to something akin to osmotic pressure, a physiological process underlying all tissue metabolism. The teeth, therefore, change from day to day, either to be built up or torn down. How shall we, then, prevent dental caries, seeing we have no pill, no vaccine or no injection to offer? There is no way to control these micro-organisms of decay but to get right in and rub them off. Strict oral hygiene is the only thing we have, perhaps not the ideal, but it is the only thing we know of. Healthy patients have no caries. If we could raise the calcium content we probably would have no caries, and there probably is a condition of phagocytosis going on in the mouths of immunes of which we know very little.

PERICLASIA.

The amoeba was given as one cause. Hartzell believes that the streptococcus viridens is the cause; but the truth is, most likely, that bacteria are the active cause, but are not the predisposing cause. What are the predisposing causes? The mucous membrane is a protective organ. The hug of this tissue around the teeth keeps it immune from organisms penetrating it. As soon as the circulation is disturbed a chain of pathological events follows. This may be from bacteria, from rough fillings, from ill-fitting crowns which cause the tissues to let go, and the organisms then gain entry. Where the circulation is good the progress is slow and tumefied gum is the only result. Where it is poor the progress of the disease is fast. This is determined not by bacteria but by the predisposing cause of the first lesion and by the state of the circulation.

THE CURE.

Keep away external irritation and such internal irritation as gout, arthritis, and insoluble substances in the blood clogging the blood vessels, and toxic assimilation from the intestines. The local prevention may be practised by the dentist, as well as general hygiene outlined, in co-operation with the physician.

It has been noticed that the character of the mouth changes materially when cleaned up by the operator and with the co-operation of the patient. The character of the secretions seems to change. Pyorrhoea can be cured by local treatment by the dentist and by the help of the patient through health, fresh air, fruit, etc.

How can these things be carried Out?

The proper restoration of individual teeth makes them self-cleansing—having them highly polished by the dentist, with the aid of Younger's Cups, carefully used, charged with fine silex to clean the teeth and tin oxid to give them a high lustre. Tell patients to reach every surface once a day with the brush, silk floss and the use of chewing gum. Keeping the teeth continually clean and stimulating the gums and tooth tissues to normal activity by mastication, brush and finger tips, achieves much. Some caries will defy even these measures.

Will a patient recompense an operator for this treatment? We think that when it is explained to the patient that practically all diseases of the teeth can be prevented and their mouths kept continually in a healthy condition by this treatment, they will more willingly pay for it than they will for repairs, and more or less painful operations.

RESUME OF DISCUSSION.

DR. WALLACE SECCOMBE.—In opening the discussion Dr. Seccombe complimented Dr. Bunting upon his address, referring particularly to the conservative attitude assumed by the speaker toward the whole subject of Preventive Dentistry. Such an attitude is

truly scientific, and in marked contrast to those who undertake experiments or research, and announce results as though the whole problem were completely solved.

The question of susceptibility and immunity to dental caries presents a very complex problem, and many factors are to be taken into account. There are questions of: (1) The inherent qualities of the teeth themselves, (2) bacteriology, (3) chemistry, (4) physiology, and (5) systemic considerations.

Reference was made to results of clinical data collected by members of last year's graduating class of the Royal College of Dental Surgeons of Ontario, covering 166 infirmary patients. Of this number 117 were susceptible to Dental Caries and 49 immune. In 116 of the susceptible cases there was a decided partiality toward carbohydrate food and particularly sugar, in the diet. In the one exceptional case the fact was recorded that the man was engaged as a "baker," which, of course, constantly caused a film of flour to be deposited upon the teeth, and in itself was quite sufficient to cause susceptibility. In every case the saliva was viscid and ropy.

Dr. Seccombe considered that mucus was a very important factor in the initial stages of dental disease (in both caries and periclasia), and reminded those present that this substance was primarily a protecting fluid for the mucous membrane of the digestive tract. Any local irritant, whether it be undigested food in the stomach or material that acted as an irritant in the mouth, calls forth a copious flow of mucus, and this in turn is a decidedly predisposing factor in the formation of plaques and accretions upon the teeth.

Over-indulgence in cane sugar is a serious menace to dental health because: (1) Its irritating qualities, during gastric digestion, cause a heavy flow of mucus in the mouth and stomach, and (2) it is lacking in inorganic salts.

The speaker referred to the great value of Dr. Bunting's work, in showing the association of a high calcium content of the saliva, with immunity to dental disease, and argued that over-indulgence in sugar had the effect of minimizing the calcium content in the body, as the inorganic content of sugar was practically *nil*.

Too much sugar, over-abundance of mucin and too little calcium, are apparently quite independent questions, but as a matter of clinical observation they appear to be, and doubtless are, related to one another.

Reference was also made to the training of dental students in the hygienic care of their mouths during their college course. Attention was drawn to the R.C.D.S. "Students' Dental History Form," used for recording the dental condition of each student, each session, throughout the college course. Only by training undergraduates in personal oral hygiene, can we expect the profession of the future to conduct the practice of dentistry along prophylactic lines.

The suggestion has been made in England of forming a Ministry of Health, the chief to hold cabinet rank. State dentistry, in this country, was mentioned as a development of the future, particularly along preventive lines, and the speaker urged the desirability of a combination of state dentistry and private practice as best calculated to meet the dental needs of the people of Canada. The members of the Toronto Dental Society were urged to co-operate with the Toronto School Dentists, and where temporary teeth required attention to either give the service, or frankly admit to the parent that it would be desirable to have the work done elsewhere. This action would be much preferable to advising the parent "not to have the temporary teeth treated," when as a matter of fact the difficulty arose through the family dentist being too busy to undertake the work. Of a staff of nineteen school dentists in Toronto, Dr. Seccombe announced that five were devoting all their time to preventive work; namely, survey, prophylaxis and class room instruction.

DR. HAROLD CLARK.—Dr. Clark complimented the essayist on the timeliness of his subject. He said there was too little attention given to the prevention of tooth decay and too much to restoration of lost tooth tissue.

It was like dealing with the menace of the house-fly by a huge propaganda for "fly-swatting," instead of eliminating the breeding places.

The essayist pinned his faith to the value of prophylactic care of the teeth, Dr. Clark maintained that while such care was well worth while, we must go further back. Some teeth that are never cared for, often do not decay, and, conversely, other teeth that receive scrupulous care are ravaged by decay. Dr. Clark was convinced that sugar was a large factor in the causation of caries. It was so tempting to the palate that one ate it, or food sweetened with it beyond the normal prompting of hunger, and in this way an over ingestion of carbohydrate resulted. This in turn resulted in a fertile condition in the mouth for the proliferation of lactic-acid-producing organisms that are responsible for tooth decay.

A diet with a proper amount of roughage to demand thorough mastication; low in sugar content, and having enough fruit acid consumed with the carbohydrate food, would probably inhibit as much decay as the most thorough prophylaxis.

DR. F. C. HUSBAND.—Dr. Husband expressed great pleasure with Dr. Bunting's address. The members of the Toronto Dental Society had keenly anticipated Dr. Bunting's coming, and he felt that the address would bear much fruit.

Regarding the calcium content of the saliva, he pointed out that probably the reason the speaker had not been able to raise the calcium content of the saliva was that it had been the form in which

the calcium had been administered, that is to say, that substances in the mineral kingdom had to be built up into the vegetable kingdom before they could be assimilated by the animal.

He felt that Dr. Bunting's method of prevention did not strike at the root of diseases of the teeth and adjacent tissues, that a very large part of the community could not afford treatment as outlined, because of the great and continued cost, and that besides these diseases would persist in spite of such treatment. He stated that the excessive amount of mucous seen in the mouth was due to irritation in any part of the digestive tract, as when more food of any class was ingested than was needed by the body for repair, or where the food was bolted and consequently acted as an irritant in the stomach or intestine.

Dr. Husband then outlined the various classes of foods required for body nutrition and the percentages of each class as follows:

Proteins (10%-15%)	Carbohydrates. (50%-65%)	Fats (30%-35%)	Inorganic Salts.
Meat.	Vegetables (except peas, beans, lentils).	Meat.	Fresh vegetables
Fish.	Grains, cereals, bread, etc.	Butter.	Fruits.
Fowl.	Sugar (confections, syrups, jams, honey).	Cream.	Bran (as in whole grain)
Eggs.	Starch, Sago, Tapioca.		
Cheese.	Fruits.		
Peas.			
Beans.			
Lentils.			
Most of the nuts.			

His observation extending over a number of years had led him to conclude that immunity to caries and periclasia could be obtained by:

1st. Observing the above balancing of the diet.

2nd. Refraining from over ingestion.

3rd. Thorough mastication and insalivation of all foods, not excluding liquids.

Where caries was rampant the patient was found to be taking a rich carbohydrate diet and excluding, to a great extent, the protein foods; and in cases of periclasia, excluding those where specific diseases of toxæmias were present, excessive over ingestion, coupled with lack of exercise, obtained.

The following specific questions are suggested as helpful to the student of this branch of dentistry:

(a) Is some food rich in protein taken at each meal?

(b) Is carbohydrate food taken almost exclusively at one or more meals each day?

(c) Foods sweetened with sugar; confections, etc., indulged in?

(d) Are green vegetables and fruits eaten frequently?

(e) Is patient, relatively, a heavy or light eater?

(f) Does patient eat more than three meals (either liquid or solid food) per day?

Dr. Husband pointed out the large economic value of this method over the prophylactic measures of Dr. Bunting, and urged that something could be done at comparatively little cost to spread this information amongst all classes, especially the poor.

Concluding his remarks attention was drawn to the menus appearing in the press, as given by the Food Controller, that whole meals were outlined comprising almost wholly carbohydrate foods. This would mean that in a short time widespread dental diseases would result, to the great detriment to public health.

Correct Posture—Why it Should be Taught in Schools

BY GEO. O. JARVIS, M.D., THE SANITARIUM, ASHLAND, ORE.

(The war has clearly shown the necessity for the "physical preparedness" of both the State and the individual citizen. Dr. Jarvis urges more information and greater interest and enthusiasm in our schools, upon the question of the "carriage" of every boy and girl. This the author urges upon the ground of preparedness and in the interest of physical and mental health. The original article appeared in the June Pacific Dental Gazette and is published here because of the special need for correct posture upon the part of practising Dentists. Some of us may not have acquired the habit during our school days, but we should strive none the less to avoid the very serious evil results referred to by Dr. Jarvis.—Editor.)

THE object of this talk is to arouse such interest that physical preparedness shall be put on a par with mental training in the schools. The same emphasis should be placed on physical as upon mental training. The best results cannot be obtained without active interest among parents and pupils, teachers and school boards.

Every scholar should and could have a fine carriage, and if such were the case there would be an inevitable improvement in physical and mental health and strength.

To do this would require no more time or money than is used at present; the need is for information, interest and enthusiasm; these three, and the greatest of these is information. Without knowledge there can be neither interest nor enthusiasm.

When insisting on correct posture one may be asked: "What good will it do?" Let us answer this question by defining correct posture and showing the harm done by any other; after which we will be in a better position to show its benefits.

To determine the proper position stand back to a wall with the feet parallel and slightly separated. Press the heels, the knees, the small of the back, the shoulders, and the head as closely as possible to the wall; stretch the whole body upward; then sway it forward from the ankles so as to bring the weight on the balls of the feet, but without otherwise altering the position.

It will then be found that a plumb line will cut the lobe of the ear, the trochanter of the femur, and fall just behind the ball of the foot.

To sit properly the upper part of the body should be in precisely the correct standing position with the weight supported on the tuberosities of the ischium; not on the sacrum or the small of the back, as shown in the illustration of faulty sitting postures.

The essentials of the normal or orthograde posture are:

1. *Head erect*, so that the eyes are on a level with the horizon.
2. *Straight, flat back*, so that the ribs will be held out as nearly horizontally as possible; thus giving greater space for the heart, lungs movements of the diaphragm, and abdominal viscera.
3. *Flat abdomen*, so that the abdominal walls shall do their part in holding the viscera in place.
4. *Pelvis at an axis of 30 deg. with the horizontal* (measuring by a line from the promontory of the sacrum to the pubic bone), in which position the Y-ligament of the hip will be tense and no muscular effort will be required to steady the hip joint. Under these circumstances the centre of gravity of the head and trunk will be directly over the head of the femur.
5. *Feet held parallel with the knees extended and the heels on the same level as the toes*; with the weight of the body *more on the balls of the feet than on the heels*. In such a posture the muscles of the calf of the leg will be moderately contracted and, as it is the muscles of the calf of the leg which help to hold the bones of the foot in place, the foot arches will be maintained in their position of greatest strength.
6. *Make the body as "tall" as possible*; so that no muscular efforts will be required except of those muscles of the back required to hold the head in position and of the muscles of the calf of the leg to keep the knee straight and the arch of the foot supported; because the ligaments of the back, hip, and knee furnish fibro-elastic mechanisms which render nervous and muscular effort unnecessary when correctly poised. The head of man is so constructed that to maintain an erect posture requires contraction in the muscles of the back of the neck.

Let us realize that while there are many ways to be sick there are comparatively few ways to become so. An analysis of patients

who require medical or surgical treatment shows that more than half are sick from five chief underlying causes:

1. *Defective attitudes* begun in childhood, which may be accused as a causative factor in most cases of chronic illness.

2. *Defective teeth*, viz., chronic inflammations around or about the roots of teeth; chronic gingivitis; pyorrhea pockets; necrosis of the jaws, etc. Likewise failure to use the teeth to chew the food properly.

3. *Use of only soft foods*, which it is possible to swallow with little mastication, which lack residue after digestion, and which do not provide certain organic and inorganic substances (salts and vitamins) needed for nutrition and to stimulate the secretory and motor functions of the gastro-intestinal canal.

4. *Use of (a) definitely detrimental articles*; such as tea, coffee, alcohol, and tobacco; or of (b) an *ill-balanced dietary*; such as one containing proportionately too much or too little protein, fat, or carbohydrate.

5. *Under-exercise* or exercise taken in a one-sided manner, developing one set of muscles and connective tissues to the neglect of others just as important to the economy.

Besides these five factors in disease production there remain only the infections, tumors, accidents, extreme old age, and hereditary deficiency to account for all the ills that befall our flesh.

More than one of these causes are concerned when health and efficiency are impaired for any reason; but let us focus our attention upon posture, with the entire understanding that the others are important and that they may all be both causes and effects of vicious postures.

So-called "*splanchnic neurasthenia*" is invariably caused or accompanied by (1) *displacements of the thoracic and abdominal viscera*, (2) *by traction upon the nerves, blood vessels, and lymph vessels* which supply the organs; and by (3) *disturbances in the splanchnic circulation*; all of which deviations from the normal lead to diseases of the heart, blood vessels, and nervous system. This enumeration of the causes of splanchnic neurasthenia really constitutes a definition of the disease.

The culmination of such a "*splanchnic neurasthenia*" is known as a "*nervous breakdown*," which is not caused by simple overwork, but which inevitably results from the effects upon the digestive, nervous, and circulatory systems of abdominal relaxation and worry.

The constant pull upon the nerves, blood vessels, and other supports of the viscera found in faulty postures produces continuing insults to the cells of the spinal cord and brain so that the functions of the cells of the central nervous system ultimately become impaired. The extent and degree of this alteration depend upon the severity and duration of the disease.

Such irritations produce, in a slow and chronic manner, injuries which correspond to the effects of a solar plexus blow or of a tearing wound of the abdomen suddenly inflicted; but one may rapidly recover from a non-lethal abdominal injury, while the chronic exhaustion of splanchnic relaxation requires months or years for its relief.

Among the effects of malnutrition, whether produced by faulty postures or by other causes, is loss of tone affecting all the tissues of the body with marked relaxation of the muscles, ligaments, fascia, tendons, and peritoneal visceral supports. Lesions of the supporting structures accentuate the pre-existing deformity and create a vicious circle composed of the segments of deformity, malnutrition, nervous disturbances, relaxed tissues, more deformity, etc., etc.

Painful symptoms may be caused by relaxation of the ligaments and muscles of the spinal column, the pelvis, and the foot arches. In the case of the spinal column and pelvis the symptoms of backache, weakness in the back, or sciatica result. If the foot arches be accused, pain may be in the anterior part of the foot (metatarsalgia), pain in the lower leg, sciatica, or pain in the back. Any or all of these relaxed states produce cord and brain exhaustion by constant irritation of the cells of the central nervous system by harmful (noci) impressions which pass thereto along the afferent nerves of the affected parts.

Flat foot, weak back, and loss of visceral tone incline their victims to sag in the knees, back, chest, and abdomen in unconscious efforts to escape in a slipshod way from the discomforts which their posture itself causes. These difficulties interfere with locomotion and predispose to a sedentary existence, while lack of exercise and mental depression further accentuate the relaxation, the indigestion, the nervousness, and the insomnia which usually accompany such unhealthy states.

A symptom-complex frequently encountered, which itself leads to further disturbances of the same nature as those which cause it, is constipation. Constipation usually results from a combination of vicious posture, insufficient mastication, ill-chosen food, and ill-balanced or deficient exercise. Let it be known that constipation is not a disease *per se*; that we are not sick merely because we are constipated; but that we are constipated because we are sick; because the nervous, secretory, and muscular efficiency of the gut tract has become seriously compromised. There are of course certain direct mechanical obstructions which cause a few cases of constipation; such as aortic aneurisms or abdominal tumors; but the vast majority of constipated individuals have no such difficulties.

Constipation, once established, leads to chronic irritation of the sphincter of the rectum; with formation of piles, papillae, and minute pockets in the mucous membrane of the lowest segment of the rectum,

all of which are developed through chronic irritation and congestion from structures normally present in the part. These pockets catch and retain bacteria and fecal residue just within the grasp of the sphincter ani; at the same level at which are found the piles and papillae just mentioned. Sometimes large fecal accumulations which the gut is unable to expel lead to exhaustion and dilatation of the lower bowel just above the anus.

A considerable expenditure of nerve energy is required to keep a sphincter muscle in a state of contraction and these rough areas produce the effect of a foreign body in the anus which it is constantly endeavoring to expel. This irritation of the mucosa-nerve-muscle apparatus of the lower bowel materially increases the strength of contraction of the sphincter muscle, leads to general sympathetic exhaustion, and gives rise to such an irritable state of the sphincter ani that it is able with difficulty to relax in response to the calls of nature, thus producing a vicious pathologic constipation-circle.

Such an irritable sphincter ani may cause little definitely localized discomfort till the piles have become large, bleeding, strangulated, and painful; till a painful fissure has developed in the mucosa; till the pockets have become infected with the production of abscesses or fistulae; or until one or more of the papillae have so increased in size as to protrude from the anus and to become strangulated by the constructive contraction of the sphincter.

The reason why local painful symptoms are often lacking is that there are no localizing pain-conducting nerves supplying the major portion of the gut tract. Any irritation except the most vigorous makes itself felt as a general lack of well-being rather than as a pain which can be accurately located in the diseased spot (or disease anlage). Abdominal difficulties are usually referred to the region of the umbilicus or to the stomach; so that it may be difficult to convince victims of kidney or intestinal disease that the pathologic state is not located in the stomach itself.

Perhaps the most general complaints of those with splanchnoptosis (relaxed abdomen with viscera displaced or rather dragged downwards, as described above) are weakness, lack of ambition, rapid fatigue, dyspnoea (difficult breathing), and marked cardiac embarrassment when walking rapidly, especially up a steep hill. Many such believe they have heart disease; even when there is no actual disease of that organ.

The explanation for these symptoms is not far to seek; the loss of "tone" affects the abdominal veins as well as the muscles and connective tissues so that the weak-walled veins, unsupported by strong abdominal walls, dilate, become overloaded, and are unable to return to the heart the blood received from the arteries. This leads to a splanchnic accumulation of insufficiently oxygenated blood sur-

charged with waste products—forming, as it were, a “pool” of stagnant blood.

Digestion, absorption, secretion, and excretion are abnormal under such circumstances and the malnutrition thus produced leads to further weakness, further relaxation, and to further vascular dilatation.

Under such circumstances the heart does not receive as much blood as it sends out and cannot long maintain the integrity of the circulation. The tissue cells then continually call on the excretory, respiratory, and circulatory centers to remove waste products and to furnish more oxygen and more fuel to the tissues. The breathing and heart beats hasten in futile attempts to respond to these demands; but the impoverished quality of the blood and the venous abdominal congestion have so diminished the quality and available quantity of the blood that the needs cannot be met.

When exercise is attempted shortness of breath and cardiac embarrassment become more apparent. In well-marked instances dizziness or faintness are observed when one suddenly stands after sitting or reclining, in which case it is easy to demonstrate, *first*, that there is a rapid gravity-flooding of the abdominal veins with blood; *second*, that the pulse becomes faster and weaker; *third*, that the viscera slide downward and forward; *fourth*, that the small of the back sinks in; and, *fifth*, that there is a distinct pallor of the upper part of the body.

In relaxed, slouching positions the following phenomena are observed: *first*, the abdominal organs slip off the anatomic “shelves” on which they normally partly rest; *second*, the forward bowing of the spine brings downward and forward the posterior mesenteric attachments of the abdominal organs, producing the same effect as if the supports were stretched; *third*, the lower abdominal muscles, belly outwards, thus increasing the antero-posterior diameter of the lower part of the body cavity; *fourth*, the chest sinks in, diminishing the capacity of the chest and upper abdomen; and, *fifth*, the organs are actually forced downward as well as permitted to drop.

The orthograde posture corrects this by lifting the organs backward and upward onto the visceral “shelves” as the back is straightened; by increasing the capacity of the upper abdomen and diminishing the capacity of its lower portion; and by improving the metabolic processes and the “tone” of the muscles.

Correct posture has been proved by percussion, blood-pressure tests, and X-ray photographs to be more efficient in accomplishing these ends than any form of corset, belt, or other adventitious visceral-supporting mechanism; which are, however, sometimes useful as “crutches” for the abdomen till health shall have been re-established.

Dr. L. T. Brown examined 746 young men who entered Harvard

this year and found that four out of five did not know how to stand straight. Only fifty stood like men—the others slouched. Only three out of five could hold themselves erect after being coached.

Health and sickness records of these students showed that sickness was largely confined to those who slouched.

Such incorrect postures as have been shown are fatiguing to their possessors, though they say they slouch “because it is the easiest way”; they increase sickness and death rates; and they lower the national vitality. Slovenly postures are in every way demoralizing.

It is not enough to say to children: “Stand erect” and then to “keep at” a child, as one woman was heard to say was her intention in dealing with her progeny. They must be shown by precept *and* example, which latter is the way both young and old learn the most rapidly. The kind of a home in which a child or a dog lives is easily told by the way they habitually act.

An erect, firm carriage is the usual accompaniment of a healthy mind and body and that considerate respect for others which arises in respect for one’s self.

A Scheme for a Ministry of Health in England and Wales

A MEMORANDUM presented by the National Insurance Organizations of the country and printed by the Insurance Publishing Company, Limited (price 4½d.), contains a concrete scheme for the establishment of a Ministry of Health, and for the transference to it of the functions hitherto discharged by various Government Departments. The main points of the scheme are as follows:

1. A Bill to be brought in at the beginning of the autumn session, which shall establish a Ministry of Health in charge of a Minister of Cabinet rank, with the specific duty of securing proper health measures and conditions throughout England and Wales.

2. The Bill to transfer from the outset to the new Ministry all the functions, other than judicial and quasi-judicial of the Insurance Commissioners for England and Wales, the excepted functions being transferred to a special body to be set up by Order-in-Council.

3. To transfer also to it from the outset all the more directly medical functions of the Local Government Board under the Public Health Acts, and at a later stage its other functions under those Acts, but none of its functions under the Poor-law until certain other changes have first been made.

4. To transfer also to it from the outset the functions of the Board

of Education as regards maternity and infant welfare, and later on in respect of creches.

5. To transfer to it from the outset the functions of the Privy Council in respect to Midwives, and later on, its other medical or analogous functions.

6. To transfer to it at a later stage the functions of the Registrar-General; certain functions of the Home Office; and those of the Board of Control for Lunacy.

The suggested Bill is to be accompanied by Exchequer grants to be disbursed by the new Ministry, for promoting health schemes of local authorities. The memorandum urges the Government to press on with legislation so that the scheme may come into effective practical working by the beginning of 1918. However improbable may be the immediate realization of such a scheme and all that it entails, we welcome the clear statement of the aims of the Approved Societies as a basis for discussion.—*Lancet*.

War Burdens on Dental Manufacture

IN a recent interesting chat with Charles A. Sykes, manager of the New York branch of Claudius Ash Sons & Company, Limited, the editor received the following information, which will be of general interest to the profession:

Major Percy C. M. Ash, one of the directors of the company, after two years active service with the British army in Flanders, was seriously wounded in the Somme offensive in September, but is now on a fair way to convalescence at Eastbourne, England.

A cousin of Major Percy, Captain Basil Ash, of the Sherwood Rangers, was killed September, 1914, at the battle of the Marne. Another cousin, Colonel Ash, was killed in the Somme offensive, September, 1916.

Over four hundred of the company's employees have served or are serving with the British army.

The Central Powers have confiscated, sold out, and appropriated the company's branch houses in Brussels, Berlin, Munich, Breslau, Frankfurt, Hamburg, Vienna, Budapest, Lemberg, Bucharest, Constantinople, placing the proceeds in their respective Imperial Treasuries, the loss to the company being over one million dollars.

Mr. J. W. Brent, for twenty years active in the dental trade of Canada, became the company's manager of the Toronto branch, 11-13 Grenville Street, in July, 1916, and the generous support given the company through him during the recent severe stress of the war by the Canadian dental profession and dental trade has been a great help in preserving the general business of the Ash Company.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE HIGH FREQUENCY VIOLET RAY APPARATUS.

RECENTLY a special effort has been made to introduce a violet ray high frequency generator into dental offices as a part of the equipment for treating such ailments as local abscesses and also for general diagnostic work. It is just possible that an explanation of manner in which such an apparatus produces its effects may prove of value to dental practitioners. For this purpose we bring before our readers an article published in October issue of "Dental Summary," by George H. Reed, Dental Surgeon, U.S. Navy. The author takes up this subject because of the lack of "literature available as to the definite action of this high frequency current on the tissues in producing the effects, and an absence of concrete information as to just what the violet ray is, how it is produced and the molecular changes brought about by its employment."

The author introduces his subject by a reference to the Du Bois Raymond theory which "presupposes the existence of electrical ions in muscular tissue . . . each muscle has within itself these ions or myomeres, each with its positive and negative pole."

The violet ray is just the ordinary current such as is used for illuminating purposes, but the voltage has been "stepped up" and is produced in a vacuum by high tension at a very low amperage. "While the force of the current is extremely large, its volume is extremely small. A force of 50,000 volts is a low voltage to use in ordinary treatments with the violet ray apparatus, and this force can be applied by the operator by reason of its high frequency, the tissues not being able to react to the strength of the charge before it is withdrawn and another substituted."

On the first inspection of the violet ray apparatus, one cannot find the ground connection because there is none as we find it in ordinary electrical apparatus. "The current goes back into the generator from which it comes, the apparatus having both the cathode and anode within itself. This explains why it is not necessary to have positive and negative hand electrodes for the patient to hold in order to direct the current through a certain path by means of the application of electrodes to each end of the path."

The usual manner of application is to place the electrode on the part to be affected. Although the whole body receives the charge,

only that section where the current enters the body and where it goes out again receives the application. It is not necessary to apply the electrode to the body of the person to be treated. Good effects may be secured indirectly, that is, by having the operator touch the electrode to his own body and simply touch with his finger the place on his patient where he wishes to apply the treatment. This is an advantageous method where it is desired to make an application in an area of a patient's mouth that is not easily accessible with the straight glass electrode. Dr. Reed explains this method of treatment as follows: "The operator's body acts as a conductor and receives the bulk of the charge, yet having enough remaining to produce a spark of appreciable length from the ends of his fingers with which to reach the spot in the mouth. This method is sometimes adopted to avoid accidental contact of the electrode and lips of the patient, which sometimes causes a shock and in all events reduces the strength of the charge."

One of the most valuable claims advanced for the use of the violet ray is its power to sterilize the part adjacent to the driving point. Here is Dr. Reed's explanation of this property: "The tissues and blood contain a large amount of sodium chloride, the normal saline solution. When a charge of electricity is passed through a wet medium, electrolysis takes place and the sodium chloride is changed into sodium hypochlorite, a powerful oxydizing agent and germicide, the action of which on tissues sterilizes the part. In this chemical change there are several intermediate changes which take place and subsidiary products are formed, but the final result is the production temporarily of sodium hyperchlorite, the sterilizing properties of which accomplish the result desired. It is not instantaneous sterilization, and the time of application has much to do with its permanency. Its value in this respect has been demonstrated by the cure of chronic abscesses without root amputation." The application of the violet ray may be of use in reducing a swelling, and its value in this connection lies in the fact that the molecular bombardment of the tissues produced by its application starts up and diffuses the congested circulation which has caused the swelling. "The high frequency generator produces an electric current that increases the body heat without increasing the temperature. It stimulates by the increased production of oxygen in the form of ozone and by the increased force and volume of the electrical content of muscle tissue itself. It loosens mechanically and chemically molecular energy, has a highly energizing effect locally and produces an increased tonicity of the part adjacent to the point of application."

It should be borne in mind that it is not the ray, no matter what its color is that does good, it is simply the charge of electricity that is of value. This electrical charge as obtained by the violet ray apparatus has value in the dental field mainly on account of its stimulative, eliminative, sedative and germicidal properties.

MORE ABOUT THE THIRD MOLAR.

L EFT for a long time in the obscurity of incomplete investigation, the third molar has received little notice in dental journals. Recently this state of affairs has changed altogether. To-day there is no tooth in the dental apparatus that receives more attention from our leading contributors to dental literature. Until lately, the tendency has been to consider this tooth as an uncertain quantity, both as regards origin and usefulness. We have been taught that its function was a subsidiary one, and that nature was working towards its complete elimination from the dental arch. This view is undergoing a change, and we are of the opinion that this tooth merits more careful consideration.

There seem to be chiefly two opinions regarding the third molars; first, that the upper third molars ought to be extracted as early as possible, and second, that the third molars, especially the lower ones, ought to be retained at all costs. Regarding the claims for the extraction of the upper third molars, the reasons advanced for this are that the vascularity of the tissue in which it is placed is such that an abscess may form at the roots of the tooth without any apparent symptoms, consequently the system will be affected injuriously for some time and the patient be unaware of it. Again, it is claimed that on account of its eruption being earlier than that of the lower third molar, it has a tendency towards serious irregularities in the lower third molars, such as impacted teeth, etc. The chief point, however, against this tooth is that it is a menace to successful orthodontia measures. Many writers of authority, claim that the eruption of this tooth, coming as it does, some time after the young patient has left the care of the skilled specialist, upsets all the good results that he obtained at so great a cost of time and skill. Many so-called failures of the orthodontist may be traced to this source. No orthodontic operations can be successful, say many writers, unless the orthodontist plans his work with the view to the ultimate placing of the third molar, and so allows space for it. If this is not done a displacement of the remaining teeth in the arch may occur. All expert orthodontists admit the reasonableness of such a view, but all are not agreed as to the best means for securing results. There are some who think that it may be best in some cases to retain the third molar and remove the second molar. As illustrative of this view we would quote from Dr. Martin Dewey's article in the September issue of *The International Journal of Orthodontia*—"The Third Molar in Relation to Malocclusion." Dr. Dewey believes that no rule can be made that will be applicable to all conditions. He says: "We have seen the mouths of individuals that undoubtedly would be better off if the third molars were extracted, and we have also seen mouths in which the dental apparatus has been mutilated, the efficiency of which has been re-

duced by the extraction of the third molar. Therefore, like a great many other problems in life, this one can not be solved the same in all cases. There is no question but that in the mouths of a great many individuals, the third molars perform very important functions during the life of the individual, during the time all of the molars are retained, and in a great many instances serves as attachments for artificial substitutes which could not be employed if the third molars were lost. In other mouths, we have found that just the reverse is true; that the third molar has not only been a source of considerable irritation, but it has also been a detrimental factor to the remaining teeth, and especially to the second molar. The third molar has a very unfavorable environment to contend with. Its period of development is an extended one. Then again there is often an insufficient space for its eruption, consequently it often becomes impacted and sets up a series of inflammatory disturbances, or it may even result in a forward movement of all the teeth, resulting in the bunching together of the anteriors."

The possibility of such a condition as just mentioned being due to the eruption of the third molar, has been disputed by many orthodontists. Dr. Dewey deals with this question as follows: "In some instances the erupting third molars, or the third molar in attempting to erupt, often meets with an interference, which causes an impaction with the second molar and causes pathological conditions, which are limited to the region of the third molar, or to the nervous reflexes. In other instances the erupting third molars will crowd the anterior teeth forward, causing a bunching either in the pre-molar or incisor region. In the majority of instances, the bunching occurs in the incisor region, owing to the fact that the incisors are held in the line of the arch only by proximal contact. If a sufficient force be exerted on the posterior side of the dental arches, carrying the posterior teeth forward, some of the incisors will slip past the proximal contact point, and consequently there will be a bunching."

Dr. Dewey recognizes that a large number of so-called failures in orthodontia have been caused by the upsetting of the dental apparatus when the third molar erupted. It is suggested that all practitioners recognize this possibility, and take measures to prevent its occurrence. He would go still farther and have us advise "our clientele and warn them that the erupting third molars are apt to produce malocclusion."

That in some cases it may be advisable to retain the third molar and extract the second molar, is Dr. Dewey's view. He says: "I have seen cases which, owing to other clinical factors, the third molar would be a more desirable tooth to have in the mouth than the second molar. . . . In other instances, I would recommend the removal of the third molar; and because of this, each case must

be diagnosed upon its merits, and each line of treatment decided according to existing conditions. I have seen third molars which were caught under the distal convexity of the second, and which otherwise were more perfect anatomical teeth than the second molars. In such instances, I think it would be better for the individual, both from the masticating standpoint and from the operative standpoint, to sacrifice the second molars and bring the third molars up into position. In other instances where the third molar is a deformed dwarf tooth, abnormal roots lying in abnormal position, the sacrifice of the third molar, even if quite an operative procedure, would be much more desirable than the sacrifice of the second molar."

There is one point in particular to which Dr. Dewey calls attention, that has not been commented upon by many writers, i.e., in a large number of cases where, for various reasons, the first molar has been removed early, the third molar comes into place more fully developed than is ordinarily the case in the complete denture. It would seem as if we must explain this condition as nature's effort to make amends for previous losses. Some say that this has no significance because the third molars and the dental arch would have been well developed even if the first molar had not been lost. The author points out the difficulty of explaining this clinical fact because "it is impossible to extract a first molar and still retain it." Dr. Dewey points out, however, that "we do know that the calcification of the third molar begins with the cusp, and for a considerable length of time the cusp is calcified, resting upon the dentine papella without the cusp being united to the central fossa and the development groove. As a result of this, pressure is produced or exists in the region where the third molar is developing, it is very likely that the dentine papilla will not have sufficient energy or sufficient growth force to cause the crown to develop to the full size, or to the size it would providing that impacted or crowded conditions did not exist. In the extraction of the first molar, the second molar invariably tips forward, relieving the impacted condition of the third molar, gives the cells of the dentine papilla a chance to expand and develop, with the result that the enamel caps of the cusp are carried apart; the enamel organ is given more room, with the result that the crown of the tooth becomes larger; and if the crown of the tooth becomes larger, the pressure on the roots is relieved and the third molar is a normal, large, well developed tooth."

The reader will recall that this view bears a good deal of similarity to that of many who favor the extraction of the upper third molar because, as they claim, it erupts some time before the lower third molar, and causes a pressure to be exerted upon the developing tooth in the lower jaw, which both retards its growth and also causes a change in the direction of eruption, so far away from the normal in many cases, as to result in a serious condition of impac-

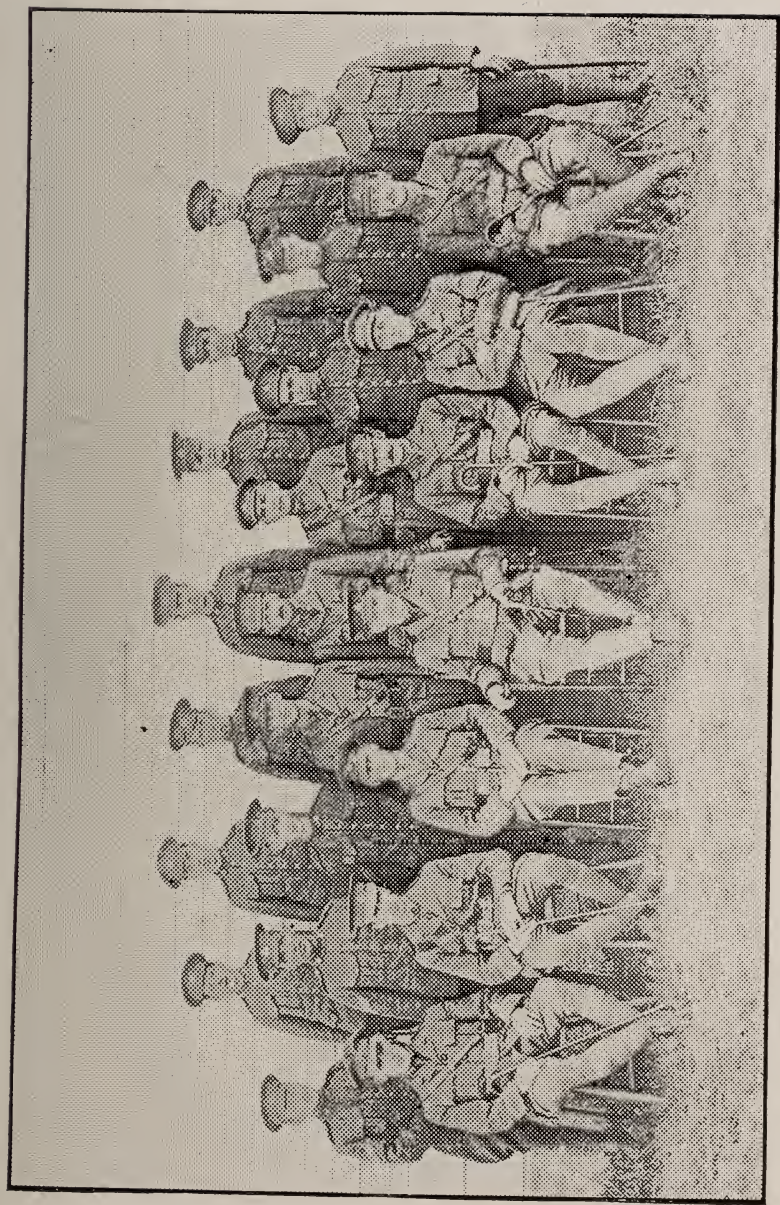
tion. It has been observed in numerous cases that with the removal of the upper third molar, the lower third molar comes into position with little or no difficulty, and impacted teeth are exceptional.

Many first molars give evidence of early decay, due, no doubt, to imperfect development, and it would appear to be good practice in some cases to remove them and use orthodontic measures with a view to bringing the second molars into such a position that they will not only serve the purpose of the lost first molar, but also provide space for the third molar when it erupts. Many patients might be saved much discomfort if such measures were instituted.

Dr. Dewey advocates the use of radiographs when treating malocclusion, whatever may be the age of the patient, so as to determine the condition of the roots of all the permanent and deciduous teeth, and also to show the possible position of the upper and lower third molars. This view is quite in accord with the opinion of many of our other most eminent orthodontists, who have continually urged the importance of anticipating the arrival of the third molars and the possibility of the arrangement of the arches being disturbed. Much of the so-called failures in orthodontia have been explained in this way.

Until recently the orthodox teaching has been that the first molar—"the key to the arch"—must be retained at all costs. This view is giving way to the more modern one, *i.e.*, that in many cases it is a beneficial measure to remove a badly decayed first molar and allow for an adjustment of the other teeth, that will readily compensate for their loss. Dr. Dewey clearly states the modern view-point in these words: "I believe that in a great many cases a much more satisfactory masticatory apparatus would have developed if that plan had been followed than if the first molar had been retained, as was the common practice a few years ago. I am not advocating the wholesale extraction of the first molar; but I do believe as a practical consideration that must be dealt with, there is a question as to which is going to be the most beneficial to the patient rather than what is going to be the ideal condition and the results in the end. I believe that the patient is much better off with two molars well developed, and in an upright position, these two being a second and third molar, than the one with three molars, one of them being the first molar with badly filled roots, the roots probably not fully developed, and a third molar which is striving for room behind the third."

The question before us all then is, shall we remove the third molars, or shall we endeavor to make them a means of aid in mastication, or allow them to remain a source of annoyance to the rest of the dental apparatus; and how are the best results to be obtained?



The Canadian Army Dental Corps—Saskatchewan Unit.

Reading from left to right: Front row—Captain Bricker, Captain McDonald, Lieut. McNeill, Major Cowan, Captain Robertson, Captain Gardiner, Captain Smith, Second row—Sergeant Whitehead, Sergeant White, Sergeant Woodbury, Captain Ross, Captain Holmes, Sergeant Tapp, Sergeant Howard and Sergeant Phillips, Top row—Private Bottomley, Private Feeny, Private Hall, Private Robertson, Private Davie, Private Wheatley and Private Meminger.

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†Director of Dental Services, address London. †Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—care of Director Dental Services, Canadian Contingents, Pembroke House, 133 Oxford Street, London, England.

of CANADIAN DENTISTS

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This Department is edited by FRED J. CONBOY, D.D.S., and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Healthy Mouths for the Children

ORAL hygiene at present is receiving more attention than any other subject at the hands of the dental profession, and is gradually being accorded by the public its deserved place as a factor in public health. The history of the movement can be traced back to the efforts of a few men, who realized the need, and who have worked for the past ten years against great odds, both in the profession and with the laity. But although their work was tedious, many obstacles being met which were difficult to overcome, oral hygiene committees are now beginning to see clearly through the dark clouds, and are encouraged by splendid results.

The boy of to-day will be the man of to-morrow, and if he is not taken care of in his youth he will not be an able-bodied warrior, prepared to fight the battles of his generation.

The parents have first to be awakened to the fact that the mouth of the child will have to be set at ease, so as to properly perform its functions. To this end the teeth must be sound, the gums in a healthy condition, and the glands and ducts secreting normal fluids. If the oral cavity is not in such condition the stomach and alimentary canal can hardly be expected to perform their duties as nature intended. As Dr. Dowd very aptly says: "If the mouth is kept clean you will never know that you have an alimentary canal."

The community has undertaken to develop the minds of the children, but that the community shall perceive the relation between sound bodies and sound minds, the state should say to the parents: "The bodies of your children must be healthy—fit homes for good minds; they must be the starting points for the self-respecting and efficient citizen of the future. If you can afford to put your child's body into that condition, you must do so. If you cannot afford it, the community will do so."

It can be clearly shown that it is cheaper for the community to make a child wholly fit and to develop it into an efficient economic unit, than it is to carry it through the school period as a retarded child, costing more than its fair share of expense, and to allow it to develop into the inefficient adult, with the necessary concomitants of hospitals, police supervision, courts and jails.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

WATERPROOFING PLASTER MODELS.—To make models which can be washed, the following procedure is used: First, the model is hardened by applying a solution of borax and alum. Then some insoluble precipitate is used which will fill up the pores and produce a very hard surface. The salts of barium, calcium, or strontium are suitable, and will not stain the model.—*Revista Dental de Peru*, per *Dental Cosmos*.—*British Dental Journal*.

NEW DENTAL SIGN OF INHERITED SYPHILIS.—R. Sabouraud (*Presse Medicale*) calls attention to the presence of the rudiment of a supplementary cusp on the internal surface of the upper first molar. Often this unusual mammillary eminence is short, rounded, and flattened against the body of the tooth; in other instances it projects more markedly, and is separated from the tooth by a distinct incisure. This peculiarity is of importance because it is easily recognized, occurs as frequently as any other single dental stigma of syphilis, and is generally unaccompanied by any of the other characteristic stigmata. It may be present in an otherwise perfect set of teeth, and is of distinct diagnostic value. In a series of twenty consecutive cases its characteristic nature was uniformly shown by a positive Wassermann test. In two cases the sign led to discovery of syphilis, as the cause of inveterate headaches, which yielded promptly to anti-syphilitic treatment.—*International Journ. of Surgery*.

TO LESSEN PAIN.—After an extraction, where bone has been removed by burs or chisels, or where alveolar process is exposed; dry the surface and apply 95 per cent. phenol, then neutralize with alcohol. This will lessen the post operative pain.—J. F. F. Waltz, Decatur, Ill.—*Dental Review*.

FACILITATING THE MANAGEMENT OF PATIENTS WITH FULL MOUSTACHES.—Patients with full moustaches are often difficult to work for, on account of the moustache shutting off the light. To prevent this, a piece of linen, about 1 in. wide, is fastened with the rubber dam holder across the lip.—*Austral. Journ. of Dentistry*.

Dr. Chant Elected Mayor

D R. R. H. CHANT was elected by acclamation for second term as Mayor of Foam Lake, Sask.—*Congratulations, Mr. Mayor.*

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, JANUARY, 1918

No. 1

EDITORIAL

The Calcium Content of Saliva

DR. RUSSELL W. BUNTING recently drew the attention of the Dental Profession to two conditions which are not generally recognized. These are (a) that the teeth are osmotic and sensitive to systemic changes, and (b) that susceptibility and immunity to Dental Caries seem to bear a definite relationship to the calcium content of the saliva. A series of tests were reported which indicate that saliva of individuals susceptible to Dental Caries contains a comparatively low percentage of calcium; while the calcium content of saliva of immunes is relatively high. It was also shown, that during the period of pregnancy, the saliva was similarly deficient in calcium and that almost immediately upon the delivery of the child, the saliva of the mother returned to normal. The calcium content of the saliva under these varying conditions might, for purposes of comparison, be represented by the following figures:—

Calcium content of saliva of immunes 30

Calcium content of saliva of susceptibles 20

Calcium content of saliva during pregnancy 18

The question presents itself as to the best way to feed calcium to a

patient deficient in that element. At the outset it should be borne in mind that many foods, which are of themselves acid, have a basic (or alkaline) end-product. That is to say, after the acid food has been assimilated, and the metabolic changes are complete, the final result in the tissues of the body, is basic rather than acid. The very reverse is the case with rich protein foods, (such as meats, fish and eggs), the resultant or end-product being acid. Consequently over-indulgence in foods of this latter class frequently results in a condition of acidosis.

The following end-product units will be of interest to the profession, and are those given by Sherman:—

Balance of Acid-Forming and Base-Forming Elements Contained in 100-Calorie Portion. Expressed as Excess of Acid or of Base and Stated in Terms of Units:—

Excess of Acid End-Product.		Excess of Base End-Product.	
Food.	Units	Food.	Units
Oysters	30	Spinach	113.
Other Fish from 5 to	12	Fresh Cucumbers	45.5
Eggs " 7 "	10	Celery	42.2
Beef or Veal " 3 "	10	Chard	41.1
Chicken	10	Lettuce	38.6
Lamb and Mutton " 3 "	5	Rhubarb	37.
Ham and Pork " 2 "	5	Dried Figs	32.3
Turkey	3.6	Fresh Tomatoes	24.5
Flour " 2.7 "	3.3	Carrots	24.
Shredded Wheat	3.3	Fresh Beets	23.6
Nuts	1	All other vegetables and fruits from 5 to	20.
		Olives	18.8
		Lemons	12.
		Oranges	11.
		Milk 2 to	5.

Sugar, tapioca and cornstarch are not included in the above table, because the inorganic elements are negligible and there is practically no end-product reaction.

It is also interesting to note those foods that are particularly high in calcium content. These are:—

Chard . . . . .	.58	Gram in 100-Calorie Portion
Cauliflower . . . . .	.55	" " " " "
Celery . . . . .	.54	" " " " "
Skimmed Milk . . . . .	.465	" " " " "
Buttermilk . . . . .	.415	" " " " "
Spinach . . . . .	.37	" " " " "
Lettuce . . . . .	.26	" " " " "
Condensed Milk (Unsweet'd) . . . . .	.264	" " " " "
Cheese . . . . .	.25	" " " " "
Whole Milk . . . . .	.239	" " " " "
Turnips . . . . .	.222	" " " " "
Cabbage . . . . .	.214	" " " " "

Canada and the Allies

HERE then is the opportunity and the task before us. The democratic nations, and ours amongst them, will emerge from the present conflict with a new faith in the possibilities of free government if inspired by the spirit of freedom. Our men who return from the war will come to us with eyes that have seen things as they are, that have looked steadfastly in the face of death, that have seen and known real greatness and cannot be deceived by the tawdry glory of wealth. We must see to it that we make for them a future Canada, worthy of their patriotism, and worthy of the monuments that shall mark in distant lands the resting places of those whose sacrifice is complete and who shall come to us no more.—STEPHEN LEACOCK.



ARTHUR D. BLACK, A. M., M. D., D. D. S.

Chicago.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, FEBRUARY, 1918

No. 2

Studies of Focal Infections About the Teeth*

BY ARTHUR D. BLACK, A.M., M.D., D.D.S., CHICAGO.

IN considering the chronic infections of the mouth—alveolar abscess and suppurative pericementitis—we should have in mind the relationship of the enamel and the gingivae to the deeper tissues. Probably we all appreciate the protective function of the enamel in relation to the pulp, and therefore in relation to the occurrence of alveolar abscess. So long as the enamel is kept intact by prophylactic measures, or decayed areas are discovered while yet small and replaced by fillings which are not too deep, the pulp will, as a rule, remain vital and abscess will be prevented. We should appreciate the fact that the gingivae perform practically the same protective function for the peridental membranes. So long as the gingivae are maintained in a state of health by proper care by the patient and due consideration by the dentist, disease of the peridental membrane will not occur. The gingivae are so constituted and so supplied with blood that they are enabled to withstand much of irritation and injury without breaking down. Probably no tissue heals more promptly when injured. Thus they protect the deeper tissues, which have not the same powers of repair.

In presenting this subject I will presume that the relationship of these chronic mouth foci to the general health is recognized. This being so, we have only to look at certain statistics which have been collected to appreciate the very serious problem which confronts the dental profession. During the past few years I have endeavored to collect data as to the incidence of these two types of chronic mouth

* Read before Toronto Dental Society, November, 1917.

infections. This data has been gathered by roentgenographic examination of the bone adjacent to the teeth. At the outset it was realized that most roentgenographs are taken because there is some indication for doing so. I therefore undertook the roentgenographic examinations of mouths of persons without regard to the condition of their mouths or health. A first tabulation was presented to the American Medical Association* last June.

For this paper I have copied selected parts of the tabulation, which covered the examination of three hundred mouths, and the percentage of persons of different ages having alveolar abscesses or pus pockets along the sides of the roots are given. It will be noted that practically half of all persons twenty-five years of age have one or more chronic alveolar abscesses and that the percentage gradually increases up to the age of fifty, when it becomes less, apparently because of extractions.

Cases of chronic pericementitis have their beginning in the mouths of adults, there being few cases before the age of twenty-five. There is a rapid increase from 9 per cent. to 32 per cent. between the ages of twenty-five and thirty, and a further increase to 64 per cent. at forty years, continuing to 74 per cent. at fifty, and 92 per cent. in the mouths of those examined who were over fifty. It should be noted that in this tabulation there were included a number of persons over forty who presented because of physical disability

Age.	Number examined.	Average number of teeth per person.	Percentage of persons, bone destroyed about apices of roots.	Percentage of persons, bone destroyed at sides of roots.	Percentage having one or both forms of infection of maxillary bones.	Total number of teeth with root fillings.	Number having good root fillings.	Number abscessed with good root fillings.	Number having poor root fillings.	Number abscessed with poor root filling.	Number root fillings not considered because not clearly shown.
17 to 25	86	30	52	9	56	198	79	3	143	101	35
25 to 29	53	29	53	32	72	121	50	10	79	54	18
30 to 39	68	26	66	64	87	236	59	5	159	89	50
40 to 49	53	25	68	74	89	185	38	3	129	83	34
50 and over ...	40	23	55	92	100	111	47	2	70	52	15
Tl. or average.	300	27	59	51	77	851	273	23	580	379	152
Total number of root fillings classified as good or poor, each root of multiple rooted teeth being counted separately											853
Number of above having good root fillings, 273; number of these abscessed, 23, which is											8%
Number of above having poor root fillings, 580; number of these abscessed, 379, which is											65%

and the figures are therefore somewhat higher than the average for persons over forty years of age.

The number of teeth was counted for each person and it is interesting to note the gradual reduction with advancing years. The fact that the number of teeth per individual is so high for this group—

* Journal of the A. M. A., Vol. 69, 1917, Page 599.

30 for those under twenty-five and 23 for those over fifty—is an indication that the persons examined were probably considerably above the general average in the care of their mouths.

There has been much discussion of the occurrence of abscesses following pulp removal and root filling. Some men have expressed the belief that all pulpless teeth should be extracted. In this tabulation two things stand out very clearly; first, the percentage of abscesses occurring when the roots are well filled is small; second, the percentage of poor root fillings is very high, indicating much lack of care in technic, and the percentage of abscesses resulting from poor root fillings is very large—67 per cent. In estimating the percentage of abscesses is due to destruction of the tissues about the no allowance was made for teeth which were abscessed before the root fillings were made, the records of the previous condition and of the treatment of the teeth not being available. These figures should carry home to each of us the importance of greater care in pulp treatment and root filling. It should also give those whose technic is thorough and painstaking a feeling of confidence for the future.

Attention is called to the fact that we have very little accurate data as to the causes of chronic alveolar abscess. We know that abscess occurs as the result of the death of the pulp, but no estimate has been made of the percentages which occur in cases in which the pulp was vital when treatment was begun. It is likely that a percentage of abscesses are due to destruction of the tissues about the apex by arsenic, that many are caused by medicaments sealed in the canals as "dressings," many are doubtless caused by faulty technic in pulp removal or root filling. It is not within the scope of this paper to discuss these questions. I simply wish to impress the fact that we can not have accurate knowledge on these matters until a considerable number of men keep and publish accurate records of cases, noting the condition of each pulp when treatment was undertaken, the various medicaments used, etc., and the final result as shown by roentgenographs taken a year or so after making the root filling. When this information is available, we will doubtless modify present plans of treatment. Until such time as the facts are before us, I think we will do well not to use drugs which will destroy soft tissue by contact, as there can be little assurance that some of the medicament sealed in the canal will not penetrate the apical foramen and reach the tissues beyond.

The percentage of adults presenting with suppurative processes involving the investing tissues of the teeth, as shown by the table, should impress upon every dentist the seriousness of the problem confronting us. If we are to do our duty in co-operation with the physician, we must not only eliminate these areas from the mouths of our patients, but also do what is much more important, prevent them in the largest possible measure in the future.

In the study of cases which may be thought to have resulted from focal infection, a word of caution should be given to both physicians and dentists. In view of the high percentage of mouth foci, it is probable that the search for other foci has been too frequently neglected. Since about seventy-five per cent. of all adults will be found to have either alveolar abscesses or pus pockets along the sides of the roots, it follows that at least three out of every four persons presenting with secondary lesions, will be found to have infections involving the maxillary bones. It is feared that too often the search for original foci ends with the discovery of the mouth infection—and in many cases other and possibly more serious foci are overlooked, and there is no improvement following the elimination of the mouth lesions. In all cases the most thorough search should be made of all regions of primary infections. While the dentist may have done his duty in clearing the mouth of infection, it is proper that he should call to the attention of both patient and physician the need of the most thorough examination, which should include the nose and accessory sinuses, the tonsils, the middle ear, the genito-urinary tract, the gall bladder and the appendix. Tuberculosis, syphilis and gonorrhea are frequent causes of the secondary manifestations commonly resulting from focal infections.

As a basis for rational treatment of the mouth lesions, a study of the tissues and the pathological changes which occur is of the utmost importance. Our long delay in arriving at a proper understanding of the problem confronting us has been due in a large measure to a lack of application of our knowledge of the histological structure and physiological function of the various specialized elements which constitute the periodontal membrane. The chronic suppuration which involves this tissue, whether in the form of an abscess at the apex of the root, or a detachment along the side of the root, destroys the connection of the periodontal membrane between the root and the bone over a given area, and after a time the cementoblasts, which normally lie on the surface of the cementum, are destroyed, and the cementum is denuded. Subsequently the fibres of the periodontal membrane disappear from the overlying soft tissue and the bone to which they were attached disappears, either by absorption or as a result of the suppuration, or both. I have cut away and examined microscopically many sections of this overlying tissue. It bears little or no resemblance to the former normal structure. All of the specialized elements are gone; it is no longer periodontal membrane, and should not under any circumstances be expected to perform the functions of that tissue. The changes are comparable to those in other tissues containing specialized elements when involved by suppurations; the specialized elements are destroyed and are not rebuilt.

At the same time the cementum has become a dead tissue. It is practically a piece of necrosed bone, but the cementum lacks a circu-

lation and has not the power possessed by bone, of exfoliating the dead portion. The denuded cementum therefore remains as a continuous irritant to the surrounding tissue and maintains the chronicity of these cases.

The man who recognizes these conditions, must realize that re-attachment of the overlying tissue does not occur; that the detachments are permanent. The treatment then at once becomes a simple matter. The root ends of abscessed teeth must be removed or the teeth must be extracted. The more I observe the cases in which root apices have been removed, the less I think of the operation. Extraction should be the standard and almost universal procedure.

For cases of chronic pericementitis in which there are pus pockets along the sides of the roots, we should think most of maintaining cleanliness and of measures to that end. While thorough scaling of teeth is important, it should be recognized that the deposits on the cementum are a result and not a cause of this condition and their removal must be considered only one item in the treatment. Wherever possible the overlying detached tissue should be cut away with the knife or cautery, leaving the denuded roots exposed. Shallow pockets may be cleaned twice daily by the patient, using a large rubber bulb syringe and normal saline solution. When the infection can not be controlled by these methods, the teeth should be extracted.

It was not the intention that this paper should take up the matter of treatment in detail. Its real object was to present, first, the high percentage of chronic infections involving the maxillary bones of adults; second, the pathological changes which occur in the periodontal tissues—changes which are a natural result of chronic suppuration and which are fatal to these tissues so far as the possibilities of repair are concerned. These are simple facts which are promptly recognized by those who have seriously studied the tissues; facts which would make much of the treatment in vogue look ridiculous, if it were not for the very serious situation which confronts us as protectors of what is to-day the largest avenue of entrance of focal infections, and therefore the field of greatest menace to health.

REMOVAL OF WAX FROM CAVITY.—The removal of the wax from the cavity is a very important detail. This should never be done by prying, nor by any other motion than a straight pull, with perhaps a slight rocking to start it. My experience has convinced me that the best method is to take a slender copper wire, hardly larger than binding wire, of about three inches in length, and heating one end in a flame to plunge it into the wax inlay at any convenient point. When it cools, a handle is formed, which will invariably unseat the wax, provided the cavity is properly shaped. If it will not do so, there is an undercut in the cavity which ought not to exist.—*E. S. Tracy (Items of Interest).*

A Report of Mandibular Fractures From Practice— and Conclusions Following Treatment

BY WILLIAM C. STILLSON, D.D.S., CLEVELAND, OHIO.

[Read before the Northern Ohio Dental Association, 1917; also before the Cleveland Unit of the Preparedness League of American Dentists and published in *Oral Health* by courtesy of the author and the Dental Summary. The Summary generously loaned the electrotypes for reproduction of illustrations.—EDITOR.]

BEFORE proceeding it should be clearly understood that the cases following have been handled along with a general practice of dentistry. Records have been kept of the cases as treated with the thought that they might be of interest to others doing a similar work, or that those expecting to take it up might profit by the errors made.

The opportunity of presenting this report is fully appreciated. The failures will be reported with the successes. It is hoped that it will be realized that this is simply an effort to "do a bit" for any who at any future time may have occasion to treat cases of a similar nature.

CASES—SIMPLE METHOD OF TREATMENT.

Case 1: Fracture occurred December 1st, 1915, the result of an automobile accident. *Fig. 1* as a Roentgenogram of the case, and it will take very careful inspection to locate the point of fracture. There was no loss of apposition of the bones and neither wiring nor splinting was necessary. The case did very well by placing two very small corks between the posterior teeth on both sides as a rest and a very light Barton bandage. In a few weeks the result was gratifying. The occlusion of the teeth was undoubtedly as good as before the fracture occurred.

ORTHODONTIC APPLIANCES.

Case 2: Fracture was the result of an automobile accident, the patient a boy of eleven years. The date of the fracture was July 14, 1916. Line of fracture was between the lower right first and second bicusps. *Fig. 2* is a Roentgenogram taken the day of the accident. *Fig. 3*, a photograph of the casts of the case superimposed, shows the line of fracture and lingual displacement of the right fragment. Impressions in this case were taken with modeling compound. Case was treated by using an ordinary Angle's expansion arch with molar clamp bands, the entire work being done in the mouth. *Fig. 4* is a photograph of the plaster cast of the lower teeth with expansion arch and bands in place. Small nuts upon the expansion arch both posterior and anterior to the tubes upon the bands made it possible to hold the case very firmly. The anterior teeth were wired to the expansion arch as illustrated in *Fig. 5*, which is a Roentgenogram of



Fig. 1.

Fig. 1. (Case I)—Roentgenogram of fracture.

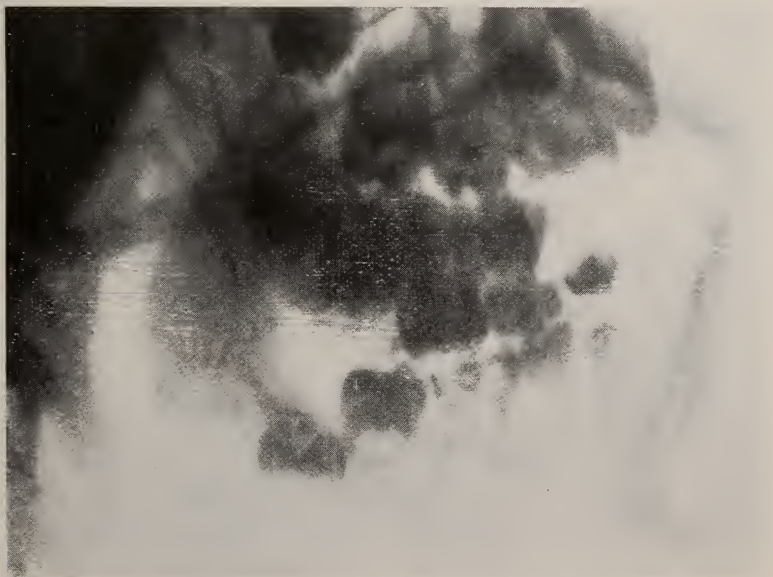


Fig. 2.

Fig. 2. (Case II)—Roentgenogram of fracture.

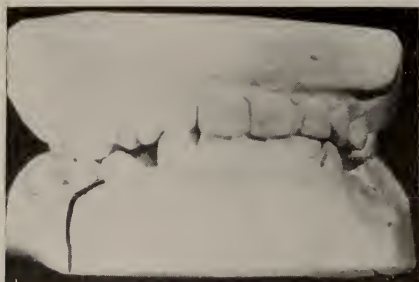


Fig 3.

Fig. 3. (Case II)—Casts superimposed. Fracture between lower right first and second bicuspid.

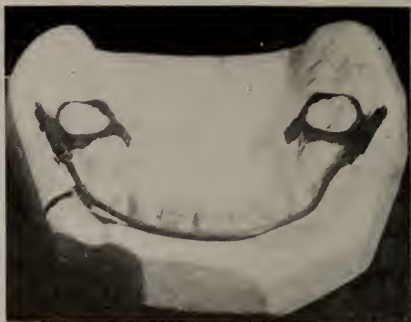


Fig. 4.

Fig. 4. (Case II)—Orthodontic appliance used in treatment.

the case taken July 19, 1916, or five days after the fracture. An expansion arch was especially indicated in this case because of the nature of the fracture and the age of the patient. The lingual displacement of the right fragment was easily overcome by the use of the arch, and it was not necessary to wire the upper to the lower teeth. This, of course, made conditions favorable for better feeding of the patient. Two days after the accident the lower right first bicuspid, which was directly in the line of fracture, came out and after the orthodontic appliance had been placed upon the teeth an attempt was



Fig. 5.

Fig. 5. (Case II)—Roentgenogram with splint in situ.

made to replace this tooth in the mouth, after cleansing with normal salt solution, by wiring to the expansion arch. It was felt at the time that the result was doubtful, and a few days later the tooth was removed. All appliances were removed from this case on August 30, 1916, about six weeks after the date of fracture. Results were very gratifying. It seems quite reasonable to believe that this simple method of treatment might be used in war dental surgery many times to very good advantage because the work may be done directly in the mouth.

Case III: Fracture occurred September 4, 1916, result of an automobile accident. *Fig 6* is a Roentgenogram taken day of accident. *Fig 7* a Roentgenogram of the case September 5, 1916, shows a little



Fig. 6.

Fig. 6. (Case III)—Roentgenogram of fracture.

more clearly the position of the fracture lines. The extent of other bodily injuries and the mutilation of the face and head was so great that for some time the patient's life was despaired of. The right eye-ball was thrown out upon the cheek; a very large wound was made on the right side of the face just below the eye, and it was thought the anterior wall of the antrum was crushed. There was also a very large wound just under the chin upon the left and also the right side. The patient was unconscious for many hours after the accident. Practically nothing was done insofar as the fracture of the mandible was concerned for almost seven weeks after the date of the accident. *Fig. 8*, a Roentgenogram taken October 14, 1916, shows



Fig. 7.

Fig. 7. (Case III)—Roentgenogram of fracture.

the lines of fracture fairly well. *Fig. 9* is a photograph of the casts of the case superimposed. These impressions were taken with modeling compound October 22, 1916. From this may be gotten an idea



Fig. 8.

Fig. 8. (Case III)—Roentgenogram of fracture.

of the extent of the mutilation insofar as the teeth were concerned. The upper incisors were entirely broken off at the gingival line; the lower right first bicuspid, cuspid and lateral were broken off; the line of fracture upon the right side being in this region. The crowns of all of the lower teeth from the second bicuspid to the third molar on the left side were broken off and thrown into the mouth. The line of fracture upon the left side was between the lower first and second bicuspid. At the time these impressions were taken most of the wounds of the face had closed excepting the two below the chin, the one upon the left side discharging pus continuously. By a comparison of *Figs. 8 and 11*, one may gain an idea of the result obtained by using an expansion arch and clamp bands. The horizontal plane of the teeth in the anterior segment was almost correct as compared with the general position of the rest of the teeth, but this entire anterior segment, which at the time of the fracture was turned outward upon



Fig. 9.

Fig. 9. (Case III)—Casts superimposed.

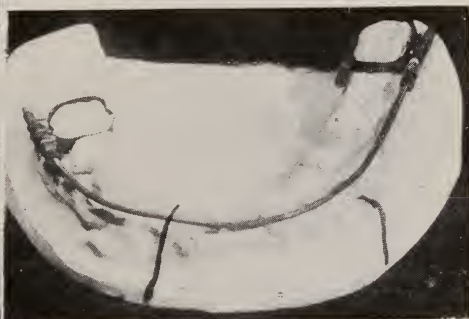


Fig. 10.

Fig. 10. (Case III)—Orthodontic appliance used in treatment. Location of fracture lines marked.

the face, was freely movable mesio-distally. *Fig. 10* is a photograph of the cast of the lower teeth showing the expansion arch and clamp bands as employed in the treatment of this case. Nuts, posterior and anterior to the tubes, were used as in *Case II*. Fortunately the lower left third molar was in good condition and could be used as an anchorage point. By placing a band upon it and upon the lower right first molar, and adjusting the arch, the anterior segment was manipulated from the position shown in *Fig. 8* to the position shown in *Fig. 11*, which is a Roentgenogram taken October 24, 1916, the day after the appliance was placed. This appliance was worn from October 23, 1916, to February 19, 1917, almost four months. During the greater part of this time pus was discharging from the wound upon the right side of the face. Periodically fragments of bone were removed from this wound, sometimes through the mucous membrane of the mouth and sometimes externally. The

fracture upon the right side in the region of the cuspid united before the one upon the left side. Extensive prosthetic restorations will have to be made before the results can be said to be gratifying. While it is true that in this case the expansion arch and clamp bands did not hold the anterior segment which was wired to the arch, in absolute firmness or rigidity, it was the opinion of the surgeon in charge that what slight movement was present would stimulate to some extent the formation of callus. Absolute union upon the right side, however, did not occur until the last fragment of bone had been removed. The discharge ceased within three days after the removal of this last piece of bone.

Case IV: Fracture, which was also the result of an automobile



Fig. 11.

Fig. 11. (Case III)—Roentgenogram with splint in situ.

accident, occurred November 1, 1916. The patient was taken immediately to the hospital and the surgeon in charge wired the bones. *Fig. 12* is a Roentgenogram after bones were wired. Silver wire was used and from what could be discerned from the appearance of the tissue at the time it was inspected, the wire had been inserted just below the necks of the teeth. On December 7, 1916, the silver wires were removed and the patient dismissed from the hospital with the instruction that the surgical work had been completed and that all that was now necessary was some work on the part of the dentist. *Fig. 13* is a photograph of the casts of this case, superimposed. These were made five weeks after the date of the accident and two days after the removal of the silver wires. They show the line of fracture between the left cuspid and the lateral incisor. They also show that while



Fig. 12.

Fig. 12. (Case IV)—Roentgenogram of fracture after surgeon had wired bones.

the surgeon had attempted to bring the bones into correct apposition and retain them with silver wire, he had overlooked to some extent the correct occlusion of the teeth. There was a downward and lingual displacement of the right segment and the patient was unable to bring the teeth of the right side into better occlusion than here shown. By examination it was determined that a fibrous incomplete union had occurred. Molar clamp bands and expansion arch were used in an attempt to secure again the correct occlusion of the teeth of the right side. By the use of the expansion arch the lingual displacement of the right fragment, was overcome. By intermaxillary rubber bands,

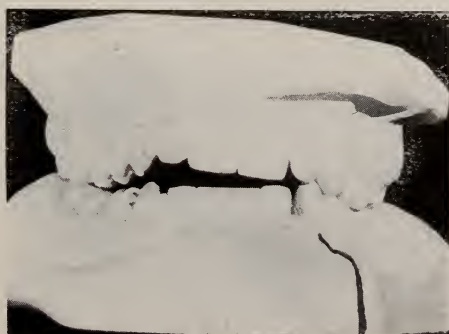


Fig. 13.

Fig. 13. (Case IV)—Casts superimposed, showing position of fracture and apposition of teeth.

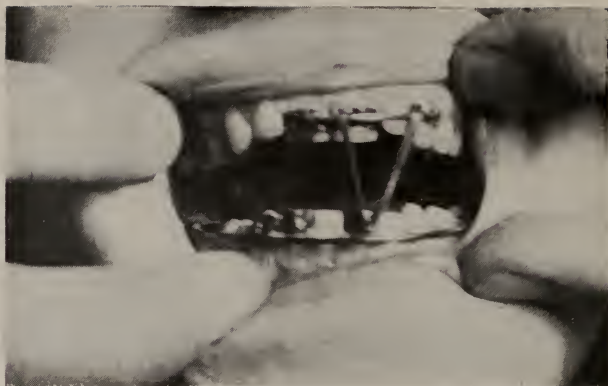


Fig. 14.

Fig. 14. (Case IV)—Orthodontic expansion arch and intermaxillary bands used in treatment.

used as shown in *Fig. 14*, this right segment was drawn up into its correct occlusion with the upper teeth. The rubber bands were worn from December 11, 1916, to December 27, 1916, after which the expansion arch and clamp bands were worn as a sort of retaining appliance, the teeth being wired to the arch. With the nuts upon the expansion arch, posterior and anterior to the tubes, the case was held in very good position until February 9, 1917, at which time all appliances were removed. *Figs. 15 and 16* show the final result. Had this case been taken at the time of fracture it is reasonable to suppose that with a very simple appliance, such as an expansion arch and molar clamp bands, the bones might have been held very easily and the necessity of using the intermaxillary rubber bands for regaining the correct occlusion been avoided. This case is only one which proves that this particular kind of work belongs in the field of the dentist.



Fig. 15.

Fig. 15. (Case IV)—Final result.



Fig. 16.

Fig. 16. (Case IV)—Final result.

INTERDENTAL SPLINTS.

Case V: Accident occurred November 18, 1916. *Figs. 17 and 18*, Roentgenograms of the case, do not show very definitely the position of the fracture lines. *Figs. 19 and 20* are photographs of the plaster casts superimposed and show the location of the fractures. Upon the left side the third molar was displaced as shown in these casts; the fracture upon that side being between the roots of the second and third molars. Upon the right side the line of fracture was between the cuspid and lateral incisor. All of the teeth were present and it was decided to use an interdental splint.



Fig. 17.



Fig. 18.

Figs. 17 and 18 (Case V)—Roentgenograms of fractures.

CONSTRUCTION OF GOLD AND PLATINUM INTERDENTAL SPLINT.

The upper cast, shown in *Figs. 19 and 20*, was mounted upon the articulator by using a face bow in the following manner: A small amount of wax was placed upon the fork of the face bow and this forced upon the upper incisors. The condyle bars of the face bow were placed over the condyles and this measurement transferred to the articulator, the upper cast being mounted in the same

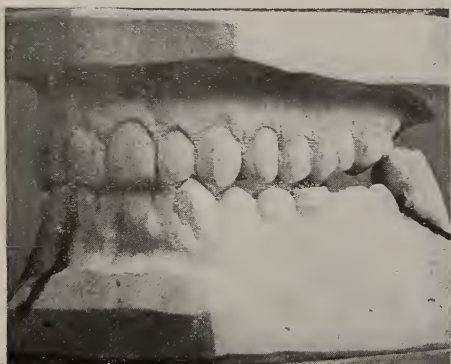


Fig. 19.

Fig. 19. (Case V)—Casts superimposed, showing location of fracture lines.



Fig. 20.

Fig. 20. (Case V)—More anterior view than Fig. 19.



Fig. 21.

Fig. 21. (Case V)—Showing method of mounting casts on articulator.

relative position from the hinge of the articulator as the upper arch from the condyles. The lower cast, shown in *Figs. 19 and 20*, was then sawed in the lines of fracture and assembled upon the articulator in correct occlusion to the upper cast.

The occlusal thirds of the teeth were then coated with sandarac varnish. Platinum foil (1-1000) was forced roughly over the occlusal surfaces of the upper and lower teeth with the thumb and



Fig. 22.

Fig. 22. (Case V)—Interdigital splint constructed and ready for insertion.



Fig. 23.

Fig. 23. (Case V)—Final result—no teeth were lost.

finger and afterward thoroughly burnished with ball burnisher. A piece of base-plate wax was then softened and forced over the platinum foil and attached to it with a warm spatula. This then was removed from the cast, trimmed to the occlusal thirds of the teeth, invested and 6-karat solder flowed over the entire surface to reinforce or strengthen. These two plates as made were then replaced upon the upper and lower casts upon the articulator and this opened to the proper point. They were waxed together there, removed from the articulator and invested. Small posts of clasp wire, about 12-gauge, may be used as braces between the opposing segments. In this case the plates were soldered together from about



Fig. 24.

Fig. 24. (Case V)—Final result—no facial deformity.

the second bicuspid back, the entire anterior portion being left open. *Fig. 21* shows the method of mounting the cast upon the articulator using the face bow, and *Fig. 22* the completed splint made of gold and platinum ready for insertion.

In this case the splint was worn between three and four weeks and held in position with a Barton bandage. *Fig. 23* shows final result in respect to occlusion and *Fig. 24* is the final photograph showing no facial deformity. About one week after the splint was removed an abscess developed in the region of the anterior fracture, but it was of short duration and did not in any way undo what had been accomplished.

Case VI: Fracture was the result of an automobile accident and *Fig. 25* is a Roentgenogram taken March 10, 1916 (day of acci-



Fig. 25.

Fig. 25. (Case VI)—Roetgenogram of fracture.

dent), showing the line of fracture upon the left side in the region of the second and third molars. The mesial root of the third molar was split away from the main body of the tooth. In this case there was no laceration of the face or of the mucous membrane. A gold and platinum interdental splint was constructed as described in *Case V*, and *Fig. 28*, a Roentgenogram taken three days after the date of fracture, shows the apposition of the bones after the splint had been placed in the mouth. The teeth were held into this splint by the use of a Barton bandage. It was considered fortunate that the distal root of the fractured molar was firmly seated in the posterior segment for this afforded a means of holding it in proper position. It was expected, of course, that the pulp would die in this tooth and an abscess result later on, but considered best to leave it in position if possible until the fragments united. *Fig. 26* is a photograph of the



Fig. 26.

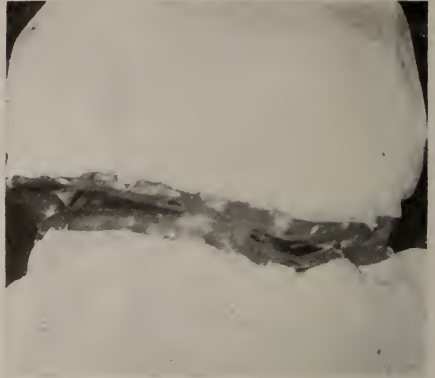


Fig. 27.

Fig. 26. (Case VI)—Lower cast sawed at fracture line, occluded with the upper and both mounted upon articulator.

Fig. 27. (Case VI)—Splint constructed ready for insertion.

casts mounted upon the articulator. There was a marked over-bite, which gave ample feeding space through the anterior portion of the splint. *Fig. 27* shows the splint constructed and ready for insertion. This was worn between three and four weeks, when a very good fibrous union had occurred.

Fig. 29 is a Roentgenogram taken May 21st, about two months after the date of fracture. The root here shown in the line of frac-



Fig. 28.

Fig. 28. (Case VI)—Roentgenogram of splint in situ.



Fig. 29.

Fig. 29. (Case VI)—Roentgenogram of case. Crown and distal root of lower left third molar had been extracted.



Fig. 30.

Fig. 30. (Case VII)—Roentgenogram of fracture at symphysis.

ture is the mesial root of the third molar. The crown and distal root of this molar had been removed by an extracting specialist in the time intervening between the removal of the splint and the date of this Roentgenogram. He undoubtedly considered it advisable to leave the mesial root of this molar until union of the bones had become more perfect in this region. Undoubtedly the root here shown has long since been removed. No infection of any sort occurred during the treatment of this case.

Case VII: This unfortunate man was an epileptic. He fell upon the pavement, striking the point of the chin. The mandible was



Fig. 31.

Fig. 31. (Case VII)—Roentgenogram of fracture in ramus.

fractured at the symphysis and across the ramus on the right side. *Figs. 30 and 31*, dated July 14, 1915, are Roentgenograms showing the position of these fractures.

Impressions of the teeth were taken in modeling compound and mounted upon the articulator, using the face bow as described in *Case V*. *Fig. 32* is a photograph of the lower cast, showing the line of fracture between the central incisors with a slight downward displacement of the right side. *Fig. 33* is a photograph of the plaster casts mounted upon the articulator, and shows the extent to which the upper anterior teeth were broken at the time of the accident.



Fig. 32.

Fig. 32. (Case VII)—Cast of lower teeth, showing fracture line.



Fig. 33.

Fig. 33. (Case VII)—Lower cast sawed and occluded to upper and both mounted on articulator, using face bow.

Case was treated by using a gold and platinum interdental splint. *Fig. 34* shows the splint constructed and ready for insertion. It may be noted that the teeth were set fairly well apart in the construction of this splint. Possibly if this case was to be treated again the casts would have been set closer together. However, the patient was very comfortable, indeed, with this splint in place which was held by using a Barton bandage. Upon the upper right side there were no teeth present and a saddle was made to rest directly upon the gum in this location by burnishing platinum foil directly to the cast as has been described. This splint was worn about four weeks and the result was very pleasing. Later the upper anterior roots were



Fig. 34.

Fig. 34. (Case VII)—Splint constructed and ready for insertion.

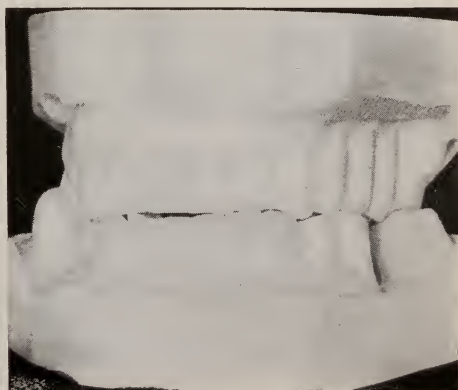


Fig. 35.

Fig. 35. (Case VII)—Photo of casts after treatment was complete. Bridge was used above.

extracted and this entire portion replaced with bridge work. *Fig. 35* is a photograph of the casts after this prosthetic restoration had been completed. The patient had occasion to return to the hospital a few months later and the surgeon insisted upon a Roentgenogram at that time. *Fig. 36* is the picture as taken, the date being October 4, 1915.

Case VIII: Fracture was entirely posterior to the teeth on the left side. *Fig. 37* is a Roentgenogram taken March 2, 1916, the day of the accident. There was a bridge just anterior to the fracture and the roots of the molar supporting it were not well fitted. There was also an area of rarefaction at the apex of the distal root of this



Fig. 36.

Fig. 36. (Case VII)—Roentgenogram of finished case.

tooth. The mucous membrane was torn, permitting the ingress of saliva at the point of fracture. It was feared also that the presence of this area of rarefaction at the apex of the distal root of the molar which was practically in the line of fracture, might also complicate matters.

Impressions were taken in modeling compound, casts made and mounted upon the articulator as described in *Case V*. *Fig. 38* is a photograph of the casts mounted upon the articulator. There was very good occlusion of the teeth, there being none missing excepting the one which was supplied by bridge work just anterior to the fracture. A splint of gold and platinum was constructed and inserted



Fig. 37.

Fig. 37. (Case VIII)—Roentgenogram of fracture.



Fig. 38.

Fig. 38. (Case VIII)—Lower cast sawed at fracture line, occluded with upper and mounted on articulator, using face bow.



Fig. 39.

Fig. 39. (Case VIII)—Roentgenogram of case after splint was inserted. Apposition of bones not good.

four days after the date of accident. *Fig. 39* is a Roentgenogram taken after the insertion of this splint. In constructing this, a small saddle was attached posterior to the main body of the splint to rest upon the gum tissue firmly for the purpose of forcing the ramus downward into position. But it may be noted in *Fig. 39* that the apposi-

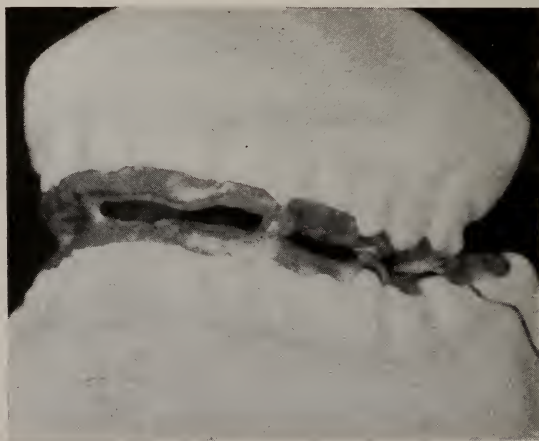


Fig. 40.

Fig. 40. (Case VIII)—Splint after readjustment. Roentgenogram of case after readjusted splint was inserted, showed no better result.



Fig. 41.

Fig. 41. (Case VIII)—Roentgenogram of case wired; interstitial wires.



Fig. 42.

Fig. 42. (Case VIII)—Final Roentgenogram.

tion of the bones in this location was not correct. This splint was removed, the braces between the upper and lower plates shortened as shown in *Fig. 40*, and again replaced and a Roentgenogram made. This negative, unfortunately, was lost, but judging from it the apposition of the bones in the fractured region was no better after the insertion of the modified splint than at first; therefore, the idea of the splint was abandoned. The teeth were wired together firmly; in doing this, 28-gauge brass wire was used and the cross wiring method



Fig. 43.

Fig. 43. (Case IX)—Roentgenogram of fracture.

employed as shown in *Fig. 41*, a Roentgenogram dated March 7, 1916, or five days after the fracture. It may be noted by a comparison of *Figs. 39 and 41* that no better apposition of the bones was secured by wiring the teeth firmly together than by employing the first splint, which set the jaws very widely apart, yet it was felt that no better result could be obtained under the circumstances. There could be little doubt of perfect occlusion finally when the teeth were firmly wired together, though the apposition of the bones was not absolutely correct.

There was considerable discharge from this wound into the mouth during the continuance of the treatment, otherwise the patient seemed comfortable. On April 5th, or about four weeks after the teeth were wired together, all wires were removed. The result was very good occlusion and no deformity of the face. *Fig. 42* is a Roentgenogram taken May 10, 1916, or about one month after the interdental wires were removed. There was still a very definite area of rarefaction about the apex of the root of the molar approximating the line of fracture. The bridge was then cut and this lower molar extracted. Sufficient union had occurred by this time to justify this extraction.

(To be continued in next issue.)

Captain R. M. Burgess, C.A.D.C., Deceased

ORAL HEALTH regrets to record the death of Captain R. M. Burgess, Canadian Army Dental Corps, M.D. No. 2, who died at the Base Hospital, Toronto, on Saturday, the 5th of January, 1918. Lieut.-Col. W. G. Thompson and the members of the C.A.D.C., M.D. No. 2, attended the funeral service, which was in charge of the Military Authorities.

Capt. Burgess' brother is an undergraduate of the Royal College of Dental Surgeons. The sympathy of the dental profession goes out to the members of the family of the late Capt. Burgess in their bereavement.

Members of the Canadian Army Dental Corps Overseas Honored

WORD has been received that Colonel Alex. Armstrong and Lieut.-Col. W. J. Bentley have been gazetted members of the new Order of the British Empire. Details are not at hand as we go to press, but the dental profession will be glad to learn that the Imperial authorities are recognizing the dental services in the more recent lists of Imperial honors, and congratulate the recipients upon the honor which has been conferred upon them.

FEATHER EDGES ON GOLD INLAYS.—To avoid "feather edges" on cast gold inlays at the gingival border insert sprue in wax pattern on the occlusal surface—never on the contact point or proximal surface.—Victor H. Fuqua, Chicago, Dental Review.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

AN IMPORTANT PHASE OF PREVENTIVE DENTISTRY.

CORRECT and early diagnosis is all important in the successful treatment of practically all body ailments. In the field of dentistry, particularly preventive dentistry, this is especially true. The restoration to a condition of health and usefulness of teeth that have suffered the ravages of caries, is unquestionably a good work. We ought not to stop at this; but rather strive to inaugurate such measures as will prevent the early destruction of tooth tissue. If we are to take this problem into our serious consideration we must first of all acquaint ourselves with those diseases, the manifestations of which we see only too frequently in the oral cavity.

In taking up a work of this kind, it is obvious that the results to be attained will be in proportion to the amount of co-operation that exists between the different interests in medicine and dentistry. Much has been accomplished in a prophylactic way in the checking of infant mortality because the medical profession entered into a serious study of the whole question of infant feeding and finally were able to put this upon a scientific basis. The result of such an effort has been two-fold, in that it not only prevented many deaths among infants, but also was the means of having them grow up into healthy adults. Dentists should strive, not only to prevent the destruction of the first dentition, but also to so order things that all the permanent teeth may be preserved in a condition of health and usefulness. With this object in view, it would be well for us to give more attention to the problem of diet and its relation to the teeth.

G. Leppmann, M.D., of St. Louis, Mo., has written a paper for orthodontists—"Constitutional Diseases in Infancy and Dentition"—in which he makes many striking observations. He says: "The close interrelation between the process of dentition and the health of the child, between mastication and growth, has not received sufficient consideration. We have only a short time ago rescued this absolutely normal physiologic process of cutting teeth from a mire of superstition. What innumerable symptoms were not ascribed to this act! We know to-day that this has little or no effect on the well-being of

the infant; but now since we are fully convinced of the harmlessness of the process of the appearance of the teeth, we have learned more and more to recognize the importance that is attached to the preservation of healthy instruments of mastication and of their normal juxta-position and contraposition."

Dr. Leppman finds that there is no evidence that will bear scientific investigation that the teeth of this age are congenitally not as strong, or, better said, as normal, as those of our forefathers. The teeth have not changed in character but the influences, such as diet, etc., to which they are subjected, have changed and with this change has come the increase in caries, mal-occlusion and allied disorders. The problem for us then, is to investigate this changed condition that is accompanied with such dire effects upon the dental organism and institute prophylactic measures.

As illustrative of the effects of changed living conditions upon the teeth, Dr. Leppmann says: "A few generations ago dental caries was almost non-existent or at least rare, while during the last fifty years caries and pyorrhea have become so prevalent that a good set of teeth is looked upon as marvelous. With the Maoris of New Zealand, as long as they existed on native diet, caries was found only in one per cent.; but after seventy years of more or less civilization, this condition occurs in about ninety-five per cent. of Maori children. Living under European influences produced a change which coincides with that prevalent under the full influence of modern western environment."

No discussion of infant feeding is complete without a reference to the old time question as to whether a child should be breast-fed or allowed to find solace in the rubber nipple. Dr. Leppmann sums up his position in this regard briefly and to the point. He says: "Cow's milk is the food for calves; human milk for human beings." So much has been written about this subject that it seems unnecessary to discuss it further in a dental paper. There is, however, one point of rare interest for dentists, especially orthodontists. Greater muscular activity is called into play through the emptying of the mammary gland than is the case when sucking a rubber nipple, hence the alveolar arches become more fully developed. The high-roofed palate and narrow arch occurs most frequently with those children who are not breast-fed during the first eight or ten months of life. Then again, the kind of food given the infant determines to a large extent the quality of the erupting teeth. It is to be noted that the breast-fed children have teeth that are better calcified than are those of children raised on cow's milk.

Dr. Leppmann favors a change of diet just at the time that the incisors appear. He recognizes these teeth as implements of gnawing and suggests that in addition to milk, the child be given a form

of hard toast or stale bread. Later, when the molars put in an appearance, a food is called for that requires a process of grinding or milling. The prevailing custom of giving a child finely divided food encourages the habit of bolting it down. Instead of allowing a child to finish its meal with some sort of sweetmeat, give it a piece of hard toast and follow this with fresh fruit, preferably a slice of orange. Such a plan if followed consistently will show a marked decrease in caries and also aid in jaw development, together with the accompanying feature of larger arches. Well developed arches mean less of the high-roofed palate, and in turn this will allow of freer passage of air through the anterior nares. It has been observed that when the full set of masticatory muscles are working properly there is a strong tendency towards the widening of the posterior opening of these parts. That there ought to be greater interest taken by the dental profession in such diseases as rickets and syphilis is generally conceded, because they bear an important relation to dentition. We have all learned that in rickets the young bone tissue does not calcify sufficiently or sometimes not at all, and that bones that are fully developed lose their lime salts during the course of the disease. But how many of us know the symptoms sufficiently well to warn the parents of the impending danger? We ought surely to be sufficiently observant for this, because we know that the dentition is strongly influenced by the disease. The following is Dr. Leppmann's description of the common symptoms of rickets:—

"The first teeth do not begin to appear at the regular, expected time; a delay occurs that sometimes puts the appearance of the first teeth off to the beginning of the third year. The interval between the cutting of the teeth is prolonged. Dentition may come in the most irregular way. The incisors of the upper jaw are usually very small, soft and friable. They show a greenish discoloration and are almost always susceptible to caries, a caries that sometimes completely amputates the tooth. The formation of tartar is excessive. The temporary teeth are frequently eroded around the neck and roots, while the permanent teeth, already damaged before their appearance, show also erosions on the body and cutting edge. Of special interest to the orthodontist are the mal-formations caused in the jaws by this disease. The lower jaw is shortened in the sagittal direction, causing what is technically called the trapeze form of the lower jaw. The upper jaw is lengthened in the frontal direction, producing a lyra form. The lower alveolar processes show a tendency to turn in; the upper alveolar processes, a tendency to turn out; thus creating the picture of malocclusion so well known to all."

These are the symptoms about the mouth that are easily detected by the dentist, and although it is of value for us to be able to recognize these, yet in a sense it is too late, because the damage by this

time has already been done. Of greater value is it for us to be able to detect the symptoms of the malady before permanent malformations have occurred. Here again, Dr. Lippmann comes to our aid and indicates the symptomatology of early rickets.

The child, although usually lively and bright, shows less vigor and cries easily. It buries its head in the pillows and moves it from side to side until the occiput becomes bald. Perspiration is very free during sleep—a sticky perspiration with a peculiar sour odor. Not until some weeks after these symptoms occur is there any change in the osseous system, hence this is a fruitful time for treatment. Fresh air, massage, exercise and baths, all tend to improve the general condition. "Internal administration of phospho cod liver oil is an absolutely sure way to overcome this malady and prevent all its consequences," says Dr. Lippmann.

Now we do not contend that a dentist should encroach upon the particular province of the medical man and take cases of rickets in hand for treatment, but we do think that all dentists, in view of the fact that they are called upon to remedy the defects of dentition resulting from the effects of the disease, should be able to detect its early symptoms and suggest a remedy. This is surely the correct meaning of dental prophylaxis.

A full report of Dr. Lippmann's paper is given in the *International Journal of Orthodontia*, December, 1917, issue, to which the reader is referred.

DENTAL RADIOGRAPHY—DESCRIPTIVE TERMINOLOGY.

Every science has a language that is peculiarly its own. A student of any science does well to early become familiar with its terminology. Radiography is no exception to this rule and we are pleased to have before us Dr. McCoy's excellent paper in the December *Journal of Orthodontia* bearing on this subject. This paper comes at an opportune time and will prove a valuable addition to current dental literature. The following are some of the points emphasized by Dr. McCoy:—

The correct designation of the X-ray is "roentgen ray," because William Conrad Roentgen announced its discovery to the world.

Roentgenology (the study and practice of the roentgen ray as applied to medicine and surgery) may be divided into two distinct fields:

(1) Its use for the production of shadow pictures or radiograms—this is called radiography or roentgenography.

(2) Its use for therapeutic purposes—this is termed radiotherapy or roentgenotherapy.

The one who is interested in the investigation of these fields is called the roentgenologist.

The successful practice of roentgenology requires more than a mere training in the mechanics of the X-ray laboratory. Partial

knowledge is insufficient and will only carry one part of the way to success.

If one's knowledge of the subject is deficient, the finest equipment in the world will not make him a true roentgenologist.

One needs to become familiar with the electrophysics of X-ray laboratory equipment; and to know the dangers attached to unskillful manipulation.

The real practice of radiography begins when the X-ray picture or radiogram has been produced. Here his knowledge of anatomy, physiology and pathology prove of great value. Clinical experience should back up his observations.

Many claim that the name of the inventor, Roentgen, ought to be incorporated as much as possible in the terminology of the subject, but this proves cumbersome in practice. For instance, it is more convenient and euphonic to say "radiogram" (verb) than "roentgenograph," or "radiogram" (noun) instead of "roentgenogram."

For convenience of reference we append Dr. McCoy's roentgen terminology:—

Roentgen ray, or X-ray.	A phenomenon in physics discovered by William Conrad Roentgen.
Roentgenology, or Radiology.	The study and practice of the roentgen ray as applied to medicine and surgery.
Roentgenologist, or Radiologist.	One skilled in roentgenology.
Roentgenogram, or Radiogram.	The shadow picture produced by the X-ray upon photographic emulsion.
Roentgenograph, or Radiograph.	(Verb). To make a roentgenogram, or radiograms.
Roentgenography, or Radiography.	The art of making roentgenograms, or radiograms.
Roentgenotherapy, or Radiotherapy.	Treatment by the application of the roentgen ray.
Roentgen dermatitis, or X-ray dermatitis.	Skin reaction due to too strong or too often repeated applications of the roentgen ray.
Roentgenographic examina- tion, or Radiographic ex- amination.	The examination and study of the shadow pictures produced by the X-ray upon photographic emulsion.
Roentgen diagnosis, or X-ray diagnosis.	Diagnosis by aid of the roentgen ray.
Roentgenize.	To apply the roentgen ray.
Roentgenization.	The application of the roentgen ray.
Roentgenism.	The untoward effect of the roentgen ray.
Pathoroentgenography, or Pathoradiography.	The study of pathologic lesions as revealed by the radiogram (or roentgenogram). It implies and renders imperative a knowledge of the pathology and the interpretation of normal and abnormal tissue densities as recorded in the radiogram.

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.

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Color Arrangement of the Flower Border and Preparation for Spring Planting

THERE is a charm about a beautiful garden that at once appeals to everyone. Wherein does this charm lie? Is it the flowers themselves? If you go into a large greenhouse you will see long rows of all kinds of beautiful flowers and as you pass up and down you will be attracted by a gorgeous lily here, a perfumed rose there or a fairy orchid over there, but no doubt you will be charmed by a simple little maiden-hair fern growing out of a crevice in the wall and drooping over a little bunch of forget-me-not that accidentally grew in some neglected corner. I know of gardens that have most exquisite varieties of choice things, large quantities of them, but I was not impressed with them. Is it extent or size—with pergolas, fountains or stone walls, that appeals to you? No doubt you have seen some little two by four back-yard that looked like a bit of fairy-land. An artist might be able to paint a tree most accurately, and a group of cattle most life-like, and a winding stream most natural, and all these could be placed on the one canvas and yet would attract but little attention. What is necessary? Composition and harmony. This is true of the garden. The tree is a picture by itself, the group of cattle is also a picture and so is the stream, but to make a landscape, these must be united into a harmonious whole. This is exactly what must be done with the flower garden, so the gardener must be an artist, and the successful one must have artistic talent to an unusual extent. The garden consists of innumerable pictures—living pictures—and these by the imagination and ingenuity of the gardener must be arranged in one harmonious whole as to color, heights, and general arrangement.

I have said before that straight lines are not very artistic, and in laying out your border have some irregular outline which narrows up and widens out in pleasing curves, and in no place, unless in very small lots, have the border narrower than four feet. Make your

plan on paper, so many feet to an inch, and divide the space into squares of two feet each way. First mark on it where you want grouping of shrubs, climbing plants or ornamental trees for back ground. Color arrangement is then perhaps the most perplexing, and it is here that individuality crops up. In fact this is seen everywhere, and a man's garden is indicative of his natural characteristics. It is impossible for me or anyone else to arrange a garden for you. It is not possible for anyone to arrange a garden to suit himself. There is always something to be eliminated or something to be changed, and this perhaps is one of its great fascinations.

However, there are a few simple principles, and to enumerate them makes them self-evident. One is to make a plan as suggested, and another is not to attempt too much. Simplicity is the key-note of the whole thing. It is better to have a few varieties in large numbers than large numbers of things in small quantities. Many groups in long, narrow, irregular shapes or drifts weaving into one another, with the tall things at the back and lower growing ones at the front. Now as to color, it is quite evident that to have the brightest colors first or even patches of bright colors here and there would not be pleasing. There is a proper situation for bright colors, and it is not at the beginning of the border, nor at the end of it, but the eye must be led up to it gradually, and recede from it in like manner. Make the brightest spot near the centre of your border. This would include the bright red flowers. There are plenty of these flowers that give you bloom in June, July and August. It is not necessary that all plants here should be bright red. You can have little groupings of white and red, or grey and red, or any other little combination, but the predominant color should be red. It would not do to have blue and red, as these do not harmonize. Before you come to the bright red you should have the darker reds, then deep orange color, then yellow, then blue, white, light pink and grey. Your border would then start with the softer colors and gradually advance to the brighter ones, and then recede to the orange, yellow, and instead of the blue, the purple and then to the grey. The grey effect is got from plants with grayish foliage, as *Yucca*, *Gypsophilla*, *Stachyo*, *Lavender*, and some of the hardy grasses as lime grass, etc..

As I said, this does not prevent you from making little harmonious groups here and there. A visitor first takes in the whole border at a glance, then on passing along he will come here to a little arrangement of colors suddenly, and there to another grouping of things which make the whole thing interesting. For example, among some of the groupings which pleased visitors to my garden, were the following:—*Phlox Divaricata* (wild blue phlox) and yellow Jonquils; White Trilliums and the bright red Darwin Tulips (*Germeriana Spathulata*); Yellow Lady Slippers and Wild Ferns; *Pynethrun*

(James Kelway) bright red, in front of White Lupines; Iris Queen of May (pink) in front of white Lupines; Delphinium—Rev. E. Lascalles (double blue) and Campanula Persicifolia Moerheimi (double white); Auchsia Italica and Campanula Persicifolia; Aconitum Wilsoni and Rudbeckia Neumanii, blue and yellow; Helianthus Rubrum (bronze) and Hardy Aster Feltham blue; Peony (Festiva Maxima) white and Iris Pallida Dalmatica—all blue.

There is no end to these little pictures that crop up in your imagination, and you try them out.

In previous papers that have appeared in "ORAL HEALTH" I have described some of the principal varieties of Hardy Flowers, and explained how some of them can be easily grown from seeds, Delphinium, Iceland Poppies, Lupines, Pyrethrums, if started in February in flats will give some bloom the same year. Agnifolia, Oriental Poppies, Gallardia, Digitalis, will give nice plants for next year.

You must bear in mind in planting out that a great many things do not reach full proportions for two or three years, and to fill in spaces, use can be made of annuals, and biennials, such as Snapdragon, Zinnia, China Asters, Marigolds, Penstemons and such like. Also bulbs can be used and should always be used, as the tulips and daffodils planted in the fall, and Gladioli, Montbretias, Hyacinthus Candicans and Primulinus Hybrids planted in the Spring. These latter are very decorative and fine for cutting, as three to five stalks come in succession from each bulb. Tub plants like Hydrangea Hortensis, Francoa, Campanula Pyramidalis, may also be used to fill in open spaces.

Having digested what is written above, and supposing you have received the latest catalogues, get your plan before you and, with your feet in the oven, make out a list as to color, height, time of blooming, soil and situation, that each plant requires. Catalogues are not the best to make your selection from indiscriminately, it is better to visit the nurseries and gardens and see them growing, so I advise you to buy at first only the indispensable ones; such as Phlox, Columbines, Delphinium, Coreopsis, Gallardia, Pyrethrums, Campanulas, etc., leaving the novelties for the future.

The end of February or first of March is the time to start any seeds that you want to try out in flats, and I might say that any dentist who cares to pay postage will receive from me a packet of seeds saved from my best flowers to be started in flats, as well as a package of something else for outdoor planting, until supply runs out.

For those who have a semi-shady place, that is, where the sun does not beat down on it or only for a short time each day, the tuberous

begonias make a fine showing. These tubers should be started in February, by filling a flat full of cocoanut fibre and sand, half and half, or leaf mold and sand, one to four, and gently pressing the tuber into it, keeping it slightly damp, and in subdued light, with not too much heat; down cellar near a window is a good place. After the growths start, pot them up in three or four inch pots in good rich soil, and bring up stairs. Put them in good light, but not too much sun, and only give sufficient water to keep growing.

These should be planted out first of June. Keep well watered and give plenty of manure, and they will begin to flower in July and continue until frost, when bulbs are lifted and saved for next year. The single ones are huge and showy, and the double ones are very pretty. These can be bought from the florist in June already started, but it is cheaper to buy the bulb and start them as directed.

Gunner V. D. Speer Honored

WORD has been received by the Royal College of Dental Surgeons that one of its Sophomore students, Gunner V. D. Speer, has been awarded the Military Field Medal and was recommended for the D. C. M. for unusual bravery in the field.

Gunner Speer has been through all the big fights, including Vimy Ridge and Passchendaele. Gunner Speer is an honor to his country and his Alma Mater.

Major C. A. Corrigan Gazetted D.A.Q.M.G.

THE dental profession will be glad to learn that Major C. A. Corrigan, who recently returned to the front after a short furlough, has been gazetted Deputy Assistant Quartermaster-General. This promotion has certainly been earned by Dr. Corrigan on merit. He has been in the war from the first and has rendered exceptional service in connection with the C.A.S.C. Major Corrigan was awarded the D. S. O. some months ago.

TO WORK AMES' BLACK COPPER CEMENT.—This may be worked so as to allow more time before the mix sets, if mixed upon a cold water slab. The fluid cement may often be dropped into place in the tooth, when it almost flashes into a set, so quickly does it harden as it acquires the tooth temperature. Also in setting crowns copper cement mixed upon the cold slab offers similar advantages, and may we not thus eliminate the disgusting putrefaction of material absorbed in zinc cement under crowns?—J. F. F. Waltz, Dental Review.

PRO BONO PUBLICO

This Department is edited by FRED J. CONBOY, D.D.S., and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Modern Dentistry and Public Health

It has been said by no less an authority than the great Dr. Mayo that the next great step in preventive medicine would be taken by the dentist. When Dr. Mayo uttered this truth he had in mind not the mechanical features of dentistry as ordinarily understood by the layman, such as fillings, bridge-work and other visible evidences of the dentists' skill, but he was referring to the infections which had a purely dental origin. That a large proportion of such diseases have their beginning in the mouth has been known to dental and medical science for some time, and dental radiology has proved conclusively the dangers to health from infected teeth. There is hardly a person who is not in need of the attention of the dentist. To enter thoroughly into the subject of dental diseases, their prevention and cure and their relation to the general health, would require extensive treatment beyond the limits of this article, but the following citations are worthy of deep consideration:

Superficial examinations by physicians (not dentists) of the Board of Health of New York City of 1914 disclose over 600,000 cases of dental defects and 60,000 cases of malnutrition, most of these being the direct result of dental disease. This did not include irregularities of the teeth and jaws, but was limited only to visible evidences of mouth and teeth infections.

As an indication of what was possible in the way of prevention of general disease, I give the results obtained in one institution for children which was fortunate in having for a dental surgeon a man skilled in his profession. For years the usual number of cases of infectious diseases, such as measles, whooping cough, diphtheria, etc., numbered about 125; for two years and more there has not been one case of these infectious diseases of childhood, the result obtained being solely due to proper attention to the oral cavity.

It is not given to all men to achieve such perfection in their work, but it emphasizes the utter neglect of most institutions of a similar character in the case of the teeth, therefore making it possible for the great prevalence of this class of disease. The time will come when it should be as exceptional for a child to have these diseases, which originate in the mouth, as it is at the present time an exception to find an adult who has not had two or more so-called children's diseases.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

PROTECTING A LANCET BLADE.—It has been recommended for a long time to protect that part of a lancet blade not needed in lancing the gums, for both adults and children, especially the latter, by wrapping it with gauze, leaving only the blade exposed. Any sudden movement of the patient would not then endanger the soft parts. Protecting gauze, thus applied, is difficult to keep in place and unless tied with thread, may loosen and be a source of annoyance. A much better plan is to cut a Johnson cotton roll slightly shorter than the blade and press the blade through the centre of it, exposing only as much of the blade as is required at the end. The roll holds tightly on the blade, and can be safely pressed against the lips or cheeks to hold them away, while the point reaches the spot desired.—*Australian Journ. of Dentistry.*

A HINT ON MIXING CEMENT.—For the proper mixing of cement a strong, pliable, rather long-bladed spatula gives the best results. It should be used rapidly with long, strong strokes. Exerting considerable downward pressure, thus compelling a thorough mechanical mixing, which is the only way to create the opportunity for an accurate chemical union, which is very necessary if the maximum density and adhesiveness is to be attained.

ANTIDOTES FOR CARBOLIC ACID.—A common antidote for carbolic acid is alcohol, but common cider vinegar is equally good, and often more handy. Externally, in full strength, it restores the functions of the skin, and removes soreness; internally, diluted one-half or two-thirds, it is to be slowly administered in teacup doses.—*Medical Summary.*

REMOVES BLOOD STAINS.—To remove blood stains use a concentrated solution of chloral hydrate, from 70 to 80 per cent. Not only recent blood stains on linen, but stains existing for from ten to twenty years—first moistened with a drop of acetic acid and then soaked for some hours in a chloral solution are said to be perfectly removed. Blood stains on white materials may also be removed by treatment with hydrogen peroxide solution. It may take some hours to act if the stain is old.—*Druggists' Journal.*

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, FEBRUARY, 1918

No. 2

EDITORIAL

State School Dentistry in New Zealand

IT is most interesting to know that, while we in the Dominion of Canada are grappling with the problem of properly safeguarding our school children from the ravages of dental disease, the dental profession in New Zealand is also working along the same line and has recently, by deputation, waited on their Government, urging the establishment of a complete system of State School Dentistry.

The plan formulated by the Committee of the New Zealand Dental Association and presented to the Government, deserves more than a passing notice. By quoting the first clause we gain some idea of the completeness of the proposed plan:

"That the Government immediately inaugurate a Dental Department for the purpose of establishing a thoroughly comprehensive system of State School Dentistry."

The proposed staff is to consist of a "Director of the Dental Department," one dentist for each group of one thousand children, and also an adequate number of inspectors to supervise the work undertaken.

In order to ensure a sufficient number of dentists to meet the extra demand on the profession, it was proposed to offer special induce-

ments to those who would be willing to serve as State Dentists. Clause four covers this point:

"To ensure a sufficient supply of School Dentists, the Committee suggests that students may receive free education at the Dental College, together with a living allowance, in return for which they will serve the State, under bond for five years, as School Dentists, at a stated salary, after which, they would have the option of continuing in the State service or of entering into private practice."

This clause, although prompted by the growing scarcity of dentists in New Zealand, yet has many unique and carefully thought out features. The dental student who is desirous of serving in the capacity of a State Dentist will, as an inducement, have his college expenses paid, his term of tuition shortened, and in return will be under bond to serve in the State Schools, at a stated salary, for five years.

This clause really constitutes the radical part of the New Zealand proposition, and seems to carry with it so much of originality and thought that we gladly place it before the Canadian profession. Evidently the members of the New Zealand Committee were broad-minded men, and were making a determined effort to cope with the increased demand that the introduction of State School Dentistry would make on the ranks of a profession already inadequate, in numbers, to cope with the dental needs of the public. However, the magnitude and estimated cost of the undertaking proved its undoing.

We notice that the Minister of the New Zealand Government, who with others received the deputation, is designated "The Minister of Public Health," not "The Medical Health Minister." It would seem that the New Zealand Government has taken the broad view in this important matter.

In replying to the deputation, this Minister of Public Health pointed out that the great objection to the plan proposed, was the serious drain on the public treasury—the scheme calling for an immediate outlay of somewhere between one hundred thousand and two hundred thousand pounds.

We believe, however, that State School Dentistry in some form is coming, not only in New Zealand, but in Canada also. We mean particularly and primarily Preventive Dentistry—including dental examination and dental instruction. Moreover, if the government's hand is to be forced in this matter, then we, as a profession, must so educate and arouse the public that they will be impressed with the real seriousness of the situation. This education will have to be largely done through the press and on the public platform, but we must not forget that much, *very much*, can be done by every practitioner, in his own office, discussing the matter with his most prominent and intelligent patients.—R. G. M.

*Sympathy is the
safeguard of the hu-
man soul against
selfishness.*

—Carlyle.



W. B. AMY, D. D. S.
President, Toronto Dental Society.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, MARCH, 1918

No. 3

Traumatism Due to Faulty Co-ordinating Bridgework*

PAUL R. STILLMAN, D.D.S., NEW YORK.

THERE is an ancient adage which bids the cobbler stick to his last. This axiom is founded on common sense. It might likewise appear, that a specialist in any particular branch should refrain from criticism of other branches of his subject; that he should adhere to his own line, leaving to others who have practical knowledge and experience any expression of disapprobation. But while the cobbler may not be a tanner he must be able to recognize and procure good leather in order to successfully ply his own trade.

In these days of many specialties it is difficult to draw a positive line of demarcation, so constantly do our subjects overlap and so close is their interdependence. The periodontist, beginning a case, must accept or reject much that is the work of specialists in other branches, and it is the shortcomings of the results in bridge-work restoration which most frequently he finds deplorable.

A realization of the growing importance of the subject of the reciprocal relations of the jaws, the occlusion of the teeth as it applies to every dental prophylactic measure and to the articulation of bridge-work in particular, is my justification for this paper.

It is quite the universal custom among those who make bridge-work to ignore the practical application of accurate measurements of the jaws, which are so necessary to successful results in all restorations for the teeth.

The theoretical principle of substituting for lost natural teeth certain artificial appliances by attaching them to healthy abutment roots

* Read before the Toronto Dental Society, 14th January, 1918.

is undoubtedly sound. It is the ultimate idea in my opinion, for the restoration of dental function. That cases so treated are followed by disaster, that they are productive of disease and even death, does not prove that the idea is fundamentally incorrect.

In every form of scientific discussion differences arise as to that which is correct and that which is not. The tests of time and usage will in the end show favor to one idea or principle to the exclusion of all others. This is as it should be, for it is by our allegiance to that which has proven good in both theory and practice that scientific advancement is made possible.

The practice of crown and bridge-work is at present undergoing a very commendable revolutionary state in its development. New systems and technique have been introduced by various men who have recognized the necessity for greater cleanliness in mouths where bridges were a necessity. Certain forms of removable bridge-work appear to have solved the problem of sanitation. Conservation of the normal pulp, and the construction of supplied dummies which represent true anatomical tooth form upon all their surfaces is yet another most commendable advance. Nevertheless the utterly inefficient and worthless type of fixed bridge represented by a row of flat back porcelain facings suspended between two-piece shell or Richmond crowns is still a familiar sight. This type of bridge with its grotesque occlusal surfaces, has always been a menace to hygiene, and the only excuse those who still produce such bridges can offer, is that they were taught the method in their college days twenty years ago.

The periodontist cannot with propriety criticize adversely any of the several types of bridges or crowns which are approved by the authorities on this subject, nor the methods and systems of procedure which enter into their construction. It is not the intention of this paper to open discussion on any other phase of bridge or crown restorations than that which deals with the co-ordinating relation of the jaws in the function of mastication, trauma of the pericementum and its pathological sequelae.

There are certain fundamental essentials in bridge-work which apply equally to all operations for the restoration of lost occlusal surfaces of the teeth, whether by bridges, crowns, inlays, fillings or plates, viz., that the occlusal surfaces which are supplied must co-ordinate with the antagonizing surfaces in the opposite jaw. Nature has produced for us the plans we are to follow in the restorations which we make for the teeth, and she protests against such work as does not prove up to her requirements, by instituting certain pathological processes in the supporting structures.

That there is a physiological movement of the teeth in the alveoli during normal function is not denied; the investing structures are singularly elastic and attachment by ankylosis in primates would be

fatal. That there is a movement of the teeth during the function of mastication, accompanied by malacia is also here affirmed. This normal movement is physiological, always slight, does not increase and is necessary to prevent fracture when marked stress is applied in the occlusion; while the latter is pathological, and is frequently accompanied by evident rarefaction of the investing structures. The physiological movement of the teeth is not easily discernible, as the change of the approximal relation is extremely slight, even when considerable force is applied. The pathological occlusal relation or traumatic occlusion is easily discernible. It is a relation due to a faulty co-ordination of the occlusal surfaces. It is an acquired condition, and among other causes, is the one I wish to bring to your attention to-night. It may be acquired at the time of the inserting of bridge-work and inlays, and it is always as fatal in one case as the other, unless the proper relief is obtained.

The prosthodontist finds that any violation of the laws of dental articulation which has to do with co-ordination in function is fatal to the practical success of every denture which he makes. Certain difficulties were encountered in the old days, prior to the introduction of anatomical articulation, chief among them the embarrassing knowledge that a denture would adhere to the mucous membrane surfaces upon which it was intended to rest, only so long as the mandible was passive, just as soon as the function of mastication was attempted the plate would become confused with any food bolus, and this resulted in a mastication of *teeth* instead of *by teeth* as was intended. Many of these dentures which in their adaptation to the mucous surfaces were valve tight as to fit, showed a perverse instability when put into service.

The bridge-worker encounters no such unsteadiness after cementing a bridge to place. The bridge is set securely upon two or more abutment teeth or roots, which are presumed to be in normal health. Dynamic stress, even at this time is discernible. It is not to be expected that a bridge will gyrate as will a plate which has no abutments to hold it in the mouth—not for a while at least, not until these abutment roots have been literally broken from the alveolar process through exactly the same incorrect mechanical stress relation as in the case of the denture.

The exodontist really believes that a vast majority of teeth are diseased and should be extracted, for it is his experience that most cases which are referred to him actually do need such treatment; while the periodontist seldom sees a case of dental periclasia having bridge-work but that it is found necessary to remove (and thus destroy) the bridge in order to proceed with the treatment. Many a handsome and exquisitely made bridge has brought a smile of virtuous pride and satisfaction to both the operator and the patient when it was cemented

to place, but there are no laughs and congratulations passed around when the abutments of the thing have been finally destroyed through septic periclasia, and it falls into the hands of the periodontist for removal.

The specialty of bridge-work seems to be noticeable unorganized, and the methods of practice quite empirical. Other branches in dentistry which require special talent and training both in the academic and technical aspects, such for instance as orthodontia, radiodontia (Roentgenology) periodontia, etc., have their own organizations which are devoted to the advancement of their several branches; they have journals and published proceedings of their meetings which are national in their scope, and which exert a wide beneficial influence toward a unification of ideas, and a standardization of technique. There are nearly a dozen men of my acquaintance who make bridge-work restoration the major branch in practice, yet their individual ideas as to what should be accepted as standard, and what should not would represent almost as many separate ideas as they have faces. There may be many, I hope there are, who construct all bridges and crowns upon the anatomical articulator, and who go to the same scientific measures to produce co-ordination in the occlusal relations of bridges as do those prosthodontists who construct full dentures upon the principle which Gysi has exemplified to dentistry. I repeat there may be many, but if so, the fact has never been brought to my notice. In the case of bridge-workers it would appear that the necessity for the proper use of the anatomical articulator seems to be less important to them in an inverse ratio at it appears important to the periodontist.

The scientific procedure of anatomical articulation is a standard method of determining just what the true relation of the teeth should be for each case. One who expects to accomplish satisfactory results in bridge-work should discard the antiquated "rule of thumb" in articulation, and apply these scientific principles. He should adopt the anatomical articulator with its possibilities for accurate measurements in ascertaining the true relation of the condyle path to the plane of occlusion. He should apply the facebow which will determine just where the casts upon which he expects to build a bridge must be placed in relation to the measurements from the condyles to incisors, and he should never set any bridge where co-ordination of the occlusal surfaces of the teeth in mastication has not first been fully proven to be accurately normal.

The prosthodontist who does not employ this method in the construction of a denture runs a very high percentage of failure. To be sure the steps necessary for the construction of a denture upon these principles increases somewhat the expense of production, but the constant necessity of remaking these cases which have resulted in failure becomes almost nil.

Dental periclasia has its most frequent and immediate contributing factor in trauma of the pericementum—trauma which is communicated to the investing tissues by an improper relation of the teeth in occlusion. These vascular investing tissues depend upon cell regeneration—a never ending metabolism—for their existence. When trauma is induced, the food supply to these structures is inhibited, malnutrition and unbalanced waste removal follow, vital resistance is lowered, and any break in the integument at the subgingival space is quickly followed by infection.

Normal tissue never becomes infected. There must first occur certain changes which make the tissue pathologically receptive, as well as some break in the integument where the infecting organisms may enter. This is true in regard to the infection of tissue which support the teeth, as elsewhere in the body. In traumatic occlusion the elastic gingival attachment of the dental ligament becomes gradually weakened and finally literally torn from the cervical cementum, opening the subgingival space for the ready entrance of extraneous material. In such an environment the mouth flora find an ideal culture media and a ready passage. Normal gingival epithelium has a very high resistance to all microorganic life, as have all the mucous surfaces of the whole alimentary tract, but when these structures have sustained a prolonged irritation, a constant and determined pounding whenever the jaws come to the closed position, they become exhausted, the natural resistive forces are found too debilitated and disorganized to repel attack. The symptoms of occlusal trauma are to be observed in mouths, perhaps years before the resistance of the investing structures have become so lowered that they become a prey to infection.

The mouth may at times be utterly neglected insofar as its sanitation is concerned, it may even tolerate the presence of badly fitting crown bands with their usual accumulations of septic debris, such a state being endured for years without evidence of periclasia, but let a beautifully carved occlusal inlay or filling be inserted, where zeal for the artistic has resulted in an abnormal cusp relation, or let a piece of bridge-work or a single crown be placed in such a mouth and the reciprocal relation of the occlusion violated, forces are immediately set up which result in tissue dystrophy and infection. This would indicate that the immunity of these tissues was sufficient in the one case, where the resistance was high, due to the normality of the occlusal relation, and insufficient in the other, where the abnormal stress relation with its accompanying interference with co-ordination had reduced the tissue resistance by traumatic occlusion.

Periodontists find bridge-work of every conceivable type in the mouths of their patients. A description of some of this should be suppressed—considered as unmentionable in polite dental circles—we

will therefore let it pass. A reasonable percentage of this work, however, reveals at a glance that it is the work of the earnest, skillful and painstaking type of practitioner, who comprises the large majority of our profession. Let me present a typical case: overlooking for the moment the well nigh fatally diseased condition of the stumps which are acting as the holding abutments, let us observe the bridge itself. One can well imagine the satisfaction of the dentist when the piece was received from the laboratory quite finished and mounted upon the little plaster of Paris cast representing the segment of the jaws, which was so generously included in the impression. One can see at a glance that the porcelain facings are not checked, nor has the solder which has been so skillfully flowed over the backings and the conventional occlusal swagings, any pits or blow holes. The reinforcement by extra plate and solder makes the shell crowns rather difficult to remove. There is an evident honesty throughout its whole composition. The shade selection of the porcelaines is excellent, and they have been ground to fit the gum contour with precision. The buccal resemblance to teeth is striking. This seems as far as we can go in commendation or compliment, for the occlusal surfaces are quite untooth-like in both outline and form. And the lingual surface—there is no lingual surface. From the lingual cusp to the buccal cervical border there is nothing—just a smooth inclined plane to encourage the tongue in its efforts to dislodge food particles. This surface has been called a self-cleansing surface, an example of misnomer of the most pronounced type. Study models of such a case would reveal that all of the occlusal contact stress had been concentrated upon the bridge, for the abutments are loose and elongated, due to a thickening of the pericementum by occlusal trauma. They are also septic. It is to-day a professional crime to set a bridge such as I have described. Infection of the abutments must inevitably follow in this case, as in that of the tooth with a root canal which has been filled with absorbent cotton. This particular kind of result in bridge-work is the outcome of unquestioning allegiance to antiquated methods, together with a disregard and ignorance of the anatomical movements of the mandible.

The making of study models as a forecast of treatment in restoration, is a common practice among many of the more advanced practitioners. These study models are typical orthodontic casts which are occluded in their true relations. Prognosis for the necessary anatomical restorations may thus be studied at leisure, and the scheme definitely decided before treatment is begun. The taking of impressions of finished cases, for the purpose of making casts for criticism of one's own results, is a practice which is indulged in by a very few—yet were this a customary practice what an infinite improvement would soon result. Diagnosis for prophylaxis in such cases as these would reveal traumatic occlusion, if present, and much harm could thus be prevented.

Were the results of these failures of bridge-work through this fault apparent after a few days or weeks, instead of after several years of unsatisfactory service; were the symptoms which are induced of a painful and inflammatory character from the very first, this paper would never have been written, for, like the prosthodontist, the bridge-worker would have definite and immediate trouble on his hands, and the remedy would have been adopted simultaneously with its introduction into the denture work.

The practice of employing laboratory assistants, or of sending cases to the public laboratories is good, provided one obtains competent workmanship. It must be remembered that these so-called mechanical dentists can only supply technical help, that they have no academic knowledge of the anatomy of the parts which are undergoing replacement, nor do they even have an opportunity to observe in practical service the appliances upon which they work. That they frequently have skill in their work, which exceeds that of the dentists who employ them, is obvious. But so has the bricklayer superior technical skill to that of the architect, and so it should be. That the laboratory man's results are ever a failure is largely the fault of those who employ him. It has been said of the alarm clock that to be successful with its use one must know more than the clock.

In investigating the relation of the dentist to the public laboratory, I have found that it is customary, for the dentist, to send to the laboratory impressions which include never more than the lateral half of the jaw; that the articulator used is of the hinge principle type; or else what is known as the "back extension" is used in place of an articulator, the latter having but one movement, lifting apart as a cover lifts from a box.

It is necessary, in order to obtain results which are satisfactory, to have an entire impression of both jaws, and to have the casts poured in some material which has sufficient hardness on the occlusal edges to withstand attrition while the case is being articulated. The antagonizing cast should never be made from a wax bite, but from a cast made from an impression and the upper and lower casts then assembled upon the anatomical articulator with the aid of the face-bow.

Bridge-work should resemble the natural teeth in so far as it is possible. Correct measurements of the crown diameters should depart from the true measurements but slightly, if at all. Lingual surfaces are of greater importance to the function of mastication than the buccal and labial and they should be reproduced with greater care. Where there is great loss of alveolar tissue in the bicuspid and molar region, lingual roots should be carved upon these surfaces to lighten the weight or thickness, never departing from the true anatomical forms which nature has adopted and which are fundamentally the correct ones.

The anatomy of the tempo-mandibular joints vary in every individual as do the shape of the ears upon the outside of the individual's head. Its development as to form is greatly influenced by the erupting arrangement of the natural teeth in their occlusal relations. Cases of uni-lateral deformities in malocclusion exhibit marked differences in the curve of the condyle path in this articulation. Certain maxillary habits are formed in each case previous to the loss of the teeth, and in any successful restoration of these lost teeth these facts should be ascertained and taken into consideration. Normal arrangement of the teeth in bridge-restoration will not be tolerated in certain cases of this type when the maxillary habit is greatly interfered with.

There are certain names to which credit for research in this work should be given, for it is by the labor of such men as Bonwill, Snow, Gysi and Williams particularly, and many others, that this science has been developed. One does not claim that there has been suggested here anything original nor admit that the anatomical articulator has not been used in these cases and found successful.

The name of Peeso is almost as familiar to the bridge-worker as is the work itself. Dr. Frederick A. Peeso has recently published a text book, entitled "Crown and Bridge-work." It is a complete working compendium for this field. If the plea which I have made here has not impressed you with the gravity of the situation, I can do no better than to quote from the writings of this master of the subject. He states: "Another fundamental to crown and bridge-work success was brought to the fore when a few scientifically inclined earnest workers, in an effort to make more effective artificial dentures, began a careful study of the various movements of the mandible during mastication. The object of these efforts was to devise a contrivance to accurately reproduce these movements so as to enable the dental workman when mounting artificial teeth to secure a more normal occlusion. Heretofore, if the upper and the lower teeth articulated with each other when the mandible was at rest, the work was deemed satisfactory, notwithstanding that the dentures were ineffective in mastication, owing to the fact that all the teeth met only when the mandible was in the rest position. At other times but few teeth were in contact. The immediate result of these investigations was a better understanding of the mechanism of mastication and a higher appreciation of the importance of normal occlusion that has since reached all departments of our profession."

"By occlusion is understood a rubbing or grinding surface contact of all the masticating surfaces of the teeth during all the movements of the mandible as is always the case with the natural teeth in their normal position. Articulation is a mere fitting together in one position only."

"This understanding of occlusion brought to the fore an imper-

fectly recognized cause of failure of many dental bridges. With the mouth closed, the teeth on these bridges fitted the opposing teeth accurately, but during mastication they touched at a few points only. Except for this fact these bridges might have given many years of excellent service, but owing to defective occlusion the force of mastication was concentrated upon a few teeth, which resulted in literally pounding the structure to pieces in a short time. In other cases the stress set up a destructive irritation in one or more of the supporting abutments, which just as surely resulted in the bridge failing. We know now that it is impossible for any one tooth to be unduly strained during mastication, or other movements of the mandible if the occlusion of the denture has been properly adjusted, be it a plate, a crown or a bridge."

This work of Peeso's is of such importance in the literature of bridge-work that I will also take the liberty of quoting from this same source from his chapter headed "Articulation." He states: "In crown and bridge-work the question of the occlusion is of most vital importance, as the stability and life of the work depends to a very great extent upon its proper occlusion with the opposing teeth."

"In all cases of bridge-work, it is absolutely essential that only first-class anatomical articulators, capable of reproducing the natural, lateral or trituating movements of the mandible, so necessary for perfect mastication, should be used. * * * Nearly all of the small so-called crown articulators on the market are absolutely worthless so far as securing good results are concerned. With these articulators the only movements possible are simply the up and down, or the opening and closing of the mandible. * * *

"In the majority of cases * * * the face-bow should be used to serve as a guide to mount models properly on the articulator."

The time has arrived when our profession is being looked upon as a group of scientifically trained men who have as their fundamental idea the prevention and cure of all disease which has its inception within the confines of the mouth. To be accredited with less would be abhorrent to every ethical practitioner. To be *producers of disease* instead of physicians, to be *destroyers of teeth* instead of dentists, to be *artisans instead of surgeons* is the very antithesis of our aspiration. So, if there has been a scandalously high rate of failure in our bridge-work, let us get together and see that this stain on the escutcheon of the best profession in the world is wiped out. Let all among us who have at heart the high ideals of our profession, either correct the practice of using a hinge articulator or quit making bridge-work.

DISCUSSION OF DR. STILLMAN'S PAPER.

DR. GEORGE W. GRIEVE.—As nearly as I can remember, this is the first occasion upon which I have ever appeared as one of the openers of the discussion of a paper before this society, so I may reasonably be excused if my remarks smack somewhat of the time-worn "maiden speech."

As I read over the paper of the essayist of the evening, I was impelled to reflect upon the calibre of the men who have come to us with papers from time to time during several years, and I felt that if a large number of the members of this Society have tried earnestly to apply many of the good suggestions offered by these men, the citizens of Toronto are surely fortunate in being able to obtain the services of really efficient dentists. The subjects treated have covered every branch of dentistry, and while several very excellent men have discussed bridgework before us, the Executive has, unintentionally I admit, erred insofar as they have brought this subject before us backwards. The members of the Executive, nevertheless, are to be congratulated upon the fact that they have at last discovered Dr. Stillman, for he has given us in his paper the fundamental principles underlying good bridgework, and I desire personally to offer Dr. Stillman my thanks for presenting the subject in the form in which he has given it this evening. Now, I am sorry to take up more time than necessary, but I feel that I must explain my last sentence. Many of those present may say to themselves, "What has bridgework got to do with orthodontia?" To answer this question I would say that Angle has defined occlusion as "the basis of the science of orthodontia." The essayist has practically told us that occlusion is the basis of the science of bridgework, and we must realize that in the restoration of lost tooth tissue, in whatever form, be it bridgework, crowns, inlays, dentures, etc., our success will be in proportion to our knowledge of and skill in restoring the teeth to their normal forms and co-ordination.

The essayist has very clearly shown that in these days dentistry is being split up into many specialties, and that the success or otherwise of the work of any man in one department is very much dependent upon that of another in some other department, so we must each of us be ready and willing to endeavor to see the view-point of the other, and make every effort to so do our work that the mouths of our patients shall be healthy and their dental apparatus efficient.

Some years ago a good friend of this Society—a Canadian born—Dr. J. Lowe Young, of New York, started a crusade in the interests of normal reproduction of tooth forms in the construction of cast gold inlays. His first paper upon this subject was read before this Society. He has since presented the subject before many societies in

America, and his efforts along this line have attracted very wide attention. Dr. Young's paper can be found in Items of Interest of May, 1913.

Later, Dr. Pond, of Rutland, Vermont, showed how natural tooth forms can be restored with amalgam. He also appeared before this Society. One of his papers can be found in the Items of Interest, January, 1914.

Dr. Arthur Black, of Chicago, also read a paper before one of our Canadian Societies along similar lines, presenting the subject somewhat in the same light as the essayist this evening, but calling attention more particularly to the ill effects resulting from faulty restoration at or near the gingival borders.

In restoring occlusal surfaces I am quite firmly convinced that there is only one correct way, and that is by carving in porcelain, amalgam, or in wax for cast and occlusal surfaces of crowns and bridges, according to the material with which the operator desires to make the restoration, taking into consideration always the excursions of the mandible. The simple hinge form of articulator and the stereotyped die plate were probably the best we knew or had at one time, but the man who would be up in line to-day must realize that these contraptions were the inventions of the devil, the Kaiser, or some of their subordinates, and would, I am sure, be loath to admit that he uses them now, but rather that he keeps them around the office to show to his friends and patients as appliances used in dentistry during the "dark ages."

The essayist has not touched upon the technic of construction of bridgework such as he describes, because that comes in a field other than his. He apparently only desires to call attention to the importance of establishing, as nearly as possible, normal co-ordination of the cusps of the teeth in occlusion, and thus avoid the pathological sequelae. Many here are conversant with the technic, and those who are not, will find recent literature full of it.

Dr. Stillman has spoken of malocclusion, or faulty occlusion, if you wish, as a result of abnormal reproduction of tooth forms, as "pathological occlusal relations or traumatic occlusion." He has very correctly named it. The results of trauma I shall not touch upon, as that will naturally be discussed by the periodontist. I venture to say that if there was no malocclusion and no faulty dentistry, there would not be much of a field for the periodontist.

As noted by the essayist, the advance which has taken place in periodontia, orthodontia and radiodontia, is due largely to the existence of many specialists, and as a result of societies in these branches, where meetings are held at close intervals, and the whole time devoted to the discussion of the work of one specialty, and the subjects closely allied with it.

The suggestion of the essayist *re* the making of accurate study

models, as practised by orthodontists, is good. This has been suggested before this Society by other men, and is, I believe, now practised by many of our most efficient dentists. I believe the essayist will agree with me when I say that these models should be made from good plaster impressions, taken as the orthodontist takes them, showing not only the crowns of the teeth, but also the tissues overlying the roots, because the angle of inclination of the roots is very important, when we wish to study the direction of strain. By the aid of these models also we are able to study the occlusion, and when mounted on a proper articulator, the articulation from all aspects. What sometimes looks like very perfect relations on the buccal aspect may be extremely faulty from the lingual, and the essayist has said that the lingual surfaces are the most important.

Dr. Stillman emphasizes the necessity of making accurate measurements of the crowns of the teeth, so that the reproductions are as nearly as possible normal in every way. This is very important. Approximo-occlusal cavities are often filled without due consideration as to the normal tooth form, and where teeth have settled together as a result of approximal decay, or the whole tooth crown is lost, the full mesio-distal and bucco-lingual diameters should be restored, and when this is done a crowding which may exist in the opposite arch as a result of the loss of tissue will be relieved, at least, if not corrected.

The form of the temporo-mandibular articulation is no doubt influenced, as suggested by the essayist, by the occlusal relations of the teeth, and this impresses us with the fact that the general practitioner should early note lack of development, or maldevelopment from various causes, in the mouths of his young patients, and have such corrected, thus preventing the formation of a faulty temporo-mandibular articulation. The average case of malocclusion should not be sent to the orthodontist when all the permanent teeth have erupted (the old-time advice), but possibly before any of these teeth have appeared. The orthodontist is placed in a very uncomfortable position, to say the least, when a child who has been in the hands of a dentist all its life is referred to an orthodontist when it has reached twelve years of age. These developing malocclusions are evident often at four years of age, and then, not later in life, is the time to start corrective procedure.

I am glad the essayist has called attention to the difference between "articulation" and "occlusion," as many are in the habit of using the term "articulation," always to describe antagonization of the teeth of the maxilla and mandible. Angle has defined "occlusion" as being "the normal relations of the occlusal inclined planes of the teeth when the jaws are closed." Pullen says "articulation" is "the relation between the antagonizing surfaces of the teeth of maxilla and mandible during the lateral and protrusive excursions of the lat-

ter, dependent upon its universal articulation at the glenoid fossa."

There is a somewhat common practice in bridge construction which is sure to lead to traumatism, that the essayist has not touched upon in his paper, viz.: the use as abutments of teeth the roots of which do not stand at the normal angle of inclination. Placing the strain of mastication upon these leaning towers, is a sure means of finding trouble.

The greatest good will result from friendly criticism among men working in different branches of our own and allied sciences, as each man, after long and earnest endeavor in a special field, will see many points which are beyond the vision of another whose energy is being expended along a different line. It is to be sincerely hoped, then, that when men in one branch call attention to what they believe to be faults in the work of those in general practice or in other specialties, that criticism will be received in the spirit in which it is given. Only by hearty co-operation in this way will the highest ideals be reached.

Some practitioners in dentistry feel that many of their patients are unable to pay a fee commensurate with the careful technic necessary to do this ideal work, and often without putting forth any decided effort to educate them to appreciate that which is better, they are content to jog along "in the rut." These men do not derive the greatest pleasure from their work, neither do they attain the position where their income is commensurate with expert service as professional men. The most painstaking dentists are usually, after a number of years in practice, found with large and lucrative practices among people who are very appreciative of their efforts. It is all a matter of education, first of yourself, and afterwards of your patients.

DR. A. J. McDONAGH.—It is gratifying to hear the President say that "wise men come from the East." It is not a new saying. It is an old saying, and the speaker of tonight has shown us that it is a true saying. But Dr. Stillman said something else to me before the meeting started, which shows the modesty of man. He said: "You are going to have one of the greatest men who has ever spoken to you, come up to speak to you for the Canadian Oral Prophylactic Association, the third week in March. That man is Dr. Gies." Well, gentlemen, if Dr. Gies is as good a specimen of New York's population as Dr. Stillman, we certainly have a treat in store for us.

The adage which Dr. Stillman made use of in the beginning of his paper, "Let the cobbler stick to his last," was never more thoroughly exemplified than it was this evening by the essayist, because from the beginning of his paper to the end thereof, Dr. Stillman, in the most beautiful language, reiterated, again and again, just one potent

thought, and that is the attribute of a great teacher. I believe that is the only one best way of teaching.

What Dr. Stillman has said to us appears, perhaps in the nature of a jar; but let us look back over the field of Dental Literature of the last few years; or rather let us consider the messages which have been brought to this Society by men who have spoken before us. We thought we were putting in inlays and fillings and crowns as well as it was possible to do, when Dr. J. Lowe Young came to one of our meetings and proved that we were all wrong, that we were doing a certain amount of harm by our fine mechanical contrivances. We were also complacently proud of our success with root canal fillings and our methods of combating discharging alveolar abscesses, when Dr. Weston Price and others came along and demonstrated to us that, in some operations, many of them in fact, we were simply harboring death-dealing germs in the mouths of our patients.

Now, Dr. Stillman appears on the scene, and shows us that we have been ruining thousands of good teeth by the insertion of the most beautifully contrived and splendidly made bridges. Let us stop for a moment, gentlemen, and think. What does it mean? Does it mean that we are no good to the public as a profession? Not at all. It simply means that we are getting on; that we are getting somewhere; that more and more every day we are doing our work from a scientific basis, and it is gratifying to know that our men are big enough to acknowledge their faults and to try and rectify them. Of course, it is always more easy to show the fault than to show the method by which it can be rectified, but we are making an honest effort.

Now, with regard to Dr. Stillman's paper, let us ask the question, what did Dr. Stillman say? What did he say was necessary? If I understand his paper, Dr. Stillman says that we must not use fixed bridges which have so-called cleansing spaces; nor must we use bridges which have porcelain facings, for the dummies, and great ledges for the grinding surfaces, articulating perhaps, but having no proper occlusion; that the lingual surfaces of the dummies must have the proper anatomical form reaching to the gum tissue; that every bridge made, must be made by the aid of an anatomical articulator, and as much care taken to produce the proper occlusion as is taken with an artificial denture. Now, if we agree to that doctrine, to that teaching, it means that we must never use a fixed bridge, because, I take it, that Dr. Stillman has not advocated those awful atrocities, called fixed bridges, with saddles resting on the gum.

Well, what about fixed and removable bridges? As far as I am concerned I would say this, that where fixed bridges have been made well, and removable bridges have been made well, the removable bridges seem to have the better effect on the periodontal tissues.

Further than that I do not want to discuss the question of bridge-work, because that department belongs to Dr. Stewart, who, unfortunately, could not take his part in the discussion tonight, and it does not belong to me.

I want to say a word in reply to a statement made by Dr. Grieve; namely, that Dr. Stillman's paper and the paper read before this Society, by Dr. Arthur D. Black, dealt with trauma as the cause of periodontoclasia, and were practically expressing the same ideas. As I remember Dr. Black's paper, Dr. Black spoke of trauma caused by food packing in between the teeth, the result of the lack of contact points, through malformation of teeth, malformation of inlays, fillings, crowns and so forth. That is an entirely different kind of trauma, and has to be dealt with in an entirely different manner from the trauma of the pericementum, caused by traumatic occlusion, described tonight by Dr. Stillman. I want to express my gratitude for the benefit I have received from Dr. Stillman's paper, and to express to him my thanks.

DR. R. D. THORNTON: I believe we should not allow the discussion of Dr. Stillman's paper to be so brief. Permit me, first, to add my word of appreciation of Dr. Stillman's efforts. Like Dr. McDonagh, I believe he has come to us this evening with one thought uppermost in his mind and has sought to impress that thought upon us by constant and frequent repetition. I think it was Dr. Osler who said that the only way to impress a thought upon your audience was by way of reiteration, reiteration, reiteration, and some wag in the audience very pointedly added "without irritation." Now a slight irritation is usually a stimulant, and I believe it is very helpful to us all to have our old ideas sufficiently jolted to start us thinking.

I may have misinterpreted Dr. Stillman's thought, but I believe Dr. McDonagh had an idea similar to mine with regard to the statement of the essayist about the soundness of the theory, and the practice also, of attaching bridgework to natural abutments. Nature has established a very sound principle in regard to the stress we may expect a natural root to bear. For example, the anterior teeth which are used for incision, have only one root, but when we examine a molar tooth we find that the forces exerted upon its surfaces come from different directions according to the inclination of its plane surfaces; the total area is greater than that of the anterior teeth, and as a result, the tooth is provided with much stronger anchorage in the maxilla or mandible by having two or three, or sometimes more roots. It must logically follow then, that when the roots of two or more natural teeth are forced to carry not only the stress of mastication, which would ordinarily come upon their own crowns, but also the stress which is placed upon the artificial restorations which are made to substitute for several more teeth that have been lost,

then the life of those natural teeth used as abutments must be shortened in proportion to the excess of work they are obliged to do. I do not suppose that any fixed law can ever be laid down to govern the amount of additional work that any root will do. That is something which must be left to the judgment of the operator, and he alone must decide for each individual case that is presented to him, what method of restoring the lost tissue will be most beneficial to his patient. I do not believe Dr. Stillman intended in his paper that the profession should return to the old method of inserting fourteen-tooth fixed bridges on four abutments, and yet that thought may be taken from his statement. I should be glad to hear Dr. Stillman enlarge upon that idea so that we may not misconstrue his meaning.

Dr. Stillman has emphasized, and rightly, too, the use of the anatomical articulator in the making of crowns and bridges. This is easy enough when extraction has been recently done and the teeth remaining are in their normal relation. We all know, however, that a great many of the cases we have to deal with are cases of long standing, and in many instances the teeth of the opposing arch have exfoliated to such a marked degree that anatomical articulation is impossible without excessive grinding of natural teeth that are otherwise sound. Sufficient grinding of these natural teeth usually involves devitalization or later pathologic pulp disturbances. Failure to grind, ruins either the aesthetic harmony of outline or the anatomical articulation with its disastrous traumatic effects that have been pointed out to us this evening. I presume this is another problem which must be solved by the dentist as each case is brought under his care.

Now, Mr. President, the essayist has demonstrated very clearly this evening the disastrous results which follow much of our present-day methods of restoring lost tissue. It seems to me that it would be very helpful to this Society if the Executive had known far enough ahead what this paper contained so that they might have arranged to have someone at our next meeting who would be capable of presenting, for our consideration, improved methods of making partial restorations which would help overcome these traumatic disturbances. Our meetings would then cease to be a series of disjointed subjects and become a real force in progressive dental education.

DR. A. D. A. MASON: I just wish to add my appreciation of Dr. Stillman's very instructive paper.

In speaking of the protection of the gum septum, and particularly that part in the interproximal space, I would like to draw the attention of the members, not so much to the contact point, as to the marginal ridge. The marginal ridge is more protection to the gum tissue than the contact point, and has a greater tendency to turn the food particles to the median line of the occlusal surface, and also

bucally and lingually from the interproximal space. If we reproduce, in our fillings, a good marginal ridge we will have a good contact point.

Now with regard to fixed and removable bridgework, some seem to be of the opinion that removable work is going to cure all the ills of bad fixed bridgework; but, I believe that fixed bridges, when properly constructed, and good judgment shown in the selection of the places in which they are inserted, are superior to any removable piece. In other words both types have their field, and we cannot use either method in all cases, so do not discard the fixed method. They fill a big place in dentistry.

DR. A. E. WEBSTER: There is always the danger of those who have not had long experience in the ups and downs of dentistry, being led astray. The beautiful carvings and contours shown to this society by Dr. Young, a few years ago, had a very stimulating effect. There was an immediate improvement in occlusal carvings, fillings and crowns. It must be borne in mind, that all teeth should not be carved up to the same form; what is a correct occlusal surface for a boy of fourteen is not at all suitable for a man of sixty. Occlusal carvings should be based on the other teeth, or the lines of occlusion, rather than some ideal taken from a dental laboratory.

DR. R. D. THORNTON: I hope I may be pardoned for rising a second time to enter this discussion, but Dr. Mason's remarks reminded me of another statement which Dr. Stillman made. In referring to one of the lantern slides he alluded to the measurements of the crowns. I believe this is very important, not from the viewpoint of traumatism, but for the patients' comfort. I refer more particularly to the bucco-lingual diameter. The mesio-distal diameter is important also in order to get proper contact points. And, by the way, I am not ready yet to admit that "the marginal ridges are the important part and *not* the contact points." I quite concur with the idea that the marginal ridges are very important, but I still believe that contact points are also very essential and must be properly shaped and properly located. Nature again has clearly exemplified the necessity for harmony in the bucco-lingual diameters. In the lower arch, particularly where the tongue is constantly in touch with the teeth, there is a gradual increase in the bucco-lingual diameter from the central incisor to the first molar. Even the transition from single-cuspid teeth to bicuspid is so slight because of the diminutiveness of the lingual cusp of the lower first bicuspid that it is scarcely discernible in many cases. And yet, how often do we see crowns, bridges and dentures made with such large lingual protrusions in place of normal-sized cusps that they become a distinct annoyance to the patients' tongue and indeed, in some cases, produce an impediment to their speech.

Clinic on Diagnosis and Treatment of Traumatic Occlusion, Given at Toronto, by Dr. Paul R. Stillman

CLARENCE E. BROOKS, D.D.S., TORONTO.

THE familiar term "traumatic occlusion" took on a new significance for those present at a clinic given by Dr. Stillman, during his recent visit to Toronto. It has been, of course, common knowledge that a tooth in gross malposition, repeatedly wrenched and twisted by the movements of the mandible, was destined to unhappy experiences. But the fact that seemingly unimportant variations in the masticatory stress on the different teeth should seriously disturb the health of the periodontal tissues, was a decidedly new doctrine.

It is Dr. Stillman's belief that the correction of traumatic conditions is a prophylactic measure in the true sense of the word, because pyorrhoea will surely develop if the trauma is allowed to remain. Again, if a pyorrheal condition has developed, no treatment is complete which permits any of the teeth to remain subject to abnormal stress.

The diagnosis of a traumatic occlusion appears in some respects to be difficult and in others reasonably easy. In the general survey of the mouth it will, indeed, require the experienced eye to detect the horizontal line on the mucous membrane, some distance from the gingival margin. The margin itself may present a pressed-back appearance which is readily discernible. If the index finger is placed on the labial or buccal surface of the suspected tooth, and the patient instructed to exercise the normal movements of the mandible, as in mastication, the abnormal thrust is readily distinguished. A frequent example of this condition is that of a lower incisor exerting abnormal pressure in its occlusal relation with the upper incisor, the upper tooth being driven labially, and the lower lingually. Also, instructions may be given to perform the protrusive and lateral movements of the incisors edge to edge, the mandible to "catch," as it were, a malposed incisor or a long-cusped crown.

Dr. Stillman's treatment is characteristic and practical. Locate the exact area of over-stress and grind sufficiently to relieve the condition. By placing carbon articulating paper between the teeth, and resorting again to the "chopping" or other movements of the mandible as are indicated, the areas requiring attention are blackened. Another method is by the biting through of slightly warmed, thin wax instead of using articulating paper. The portions of the teeth showing through the wax are then blackened with a lead pencil, and

the wax removed. To relieve the stress, grind with small stones on the exact area previously located. This may produce another malocclusion at some other point, which in turn must be corrected. The tooth, at a later date, may be found to have come again into malocclusion, and repeated grinding may be necessary in order to retain the tooth in normal co-ordination.

In cases where the wearing down of the teeth has been excessive, and large areas of dentine are exposed on the occlusal surfaces, it will be found that the wear of extensive metal or porcelain restorations has not kept pace with the wearing down of the dentine. These conditions are a fruitful source of trauma, and all such should be tested with carbon articulating paper, and corrected where indicated. This correction is necessary not only once, but at intervals sufficiently frequent to maintain proper occlusion.

A valuable hint was thrown out by Dr. Stillman regarding the relief of extreme sensitiveness of the cementum, during scaling operations. Take a bit of split bamboo which is hard on one side and has pith on the other, trim it thin and almost to a point, dip into 40 per cent. formaldehyde solution until saturated, and gently rub the hypersensitive area. Great caution must be observed that the bamboo be not dripping with the solution, or the gums will be injured by the formaldehyde.

The clinic was given in the office of Dr. A. J. McDonagh, and was indeed appreciated by those present. They are indebted to Dr. Stillman for his courtesy in bringing to their attention conditions, the knowledge of which will have far-reaching effects on many phases of operative procedure.

National Dental Association Meeting, 1918

THE officers of the N. D. A. have already announced the dates for the next meeting of the Society to be held in Chicago, August 5th to the 9th, 1918. The Auditorium Hotel will be the convention headquarters, and plans are already under way for a meeting that will surpass even the New York convention of last year.

Major Logan is president of the Association and Dr. Buckley chairman of the Publicity Committee. Among the interesting features of the convention will be the dedication of a memorial monument to the late Dr. G. V. Black.

A suggestion has been made that the Black Memorial take the form of a library or museum with facilities for scientific research, thus carrying on perpetually the work which Dr. Black was a pioneer in initiating. The committee authorized to collect money for this purpose reported at the New York convention that over \$7,500 had been subscribed to that date.

A Report of Mandibular Fractures From Practice— and Conclusions Following Treatment

BY WILLIAM C. STILLSON, D.D.S., CLEVELAND, OHIO.

(Continued from February number.)

LINGUAL BAR SPLINT.

Case IX: A workman was struck by a piece of wood, hurled from a machine. Mandible was fractured in the region of the right cuspid and in the region of the left first bicuspid. *Fig. 43* is a Roentgenogram of the fracture taken the day of the accident, November 16, 1916, and *Fig. 44* is a photograph of the casts superimposed. Impressions were taken in modeling compound. A bridge attached to the upper right lateral, and supplying the central incisor, was completely dislodged, together with the lateral root. All the teeth of the right side from second bicuspid posterior were displaced inward, as may be seen in *Fig. 44*. The anterior segment containing the four incisors and the left cuspid was freely movable.

The lower cast was sawed along the lines of fracture and assembled upon the upper cast, restoring the correct occlusion. *Fig. 45* is a photograph of the casts after this had been done. The upper left central, lateral and cuspid were so loose and inflamed from the blow that it was not considered wise to attempt to wire the lower anterior segment to them. It was necessary, therefore, to construct some sort of an appliance by which the anterior teeth might be held in correct position. Upon the lower cast a splint was made engaging the lingual surfaces of the teeth. Molar clamp bands were fitted to the



Fig. 44

Fig. 44. (Case IX)—Casts superimposed, showing lingual displacement of right side.



Fig. 45.

Fig. 45. (Case IX)—Casts superimposed after lower had been sawed and occluded to upper.

left third molar and to the right second molar. A heavy bar of platanoid was bent to engage the lingual surfaces of the teeth. German silver banding material was burnished to the lingual surfaces of the teeth, later waxed to the platanoid bar, removed, invested and soldered with German-silver solder. At the same time the molar clamp bands were soldered to the lingual bar and it was reinforced in the region of the fracture lines. A good idea of this splint can be obtained from *Fig. 46*. Holes were then bored at different points through which wires might be passed for definitely holding the splint in position and it was then gold plated.

It was necessary to administer nitrous oxid and oxygen anesthesia to insert the lingual splint. This was done at the hospital, but the anesthetic was not entirely satisfactory and in inserting the splint the clamp band on the right second molar was broken. This is



Fig. 46.

Fig. 46. (Case IX)—Lingual splint constructed.

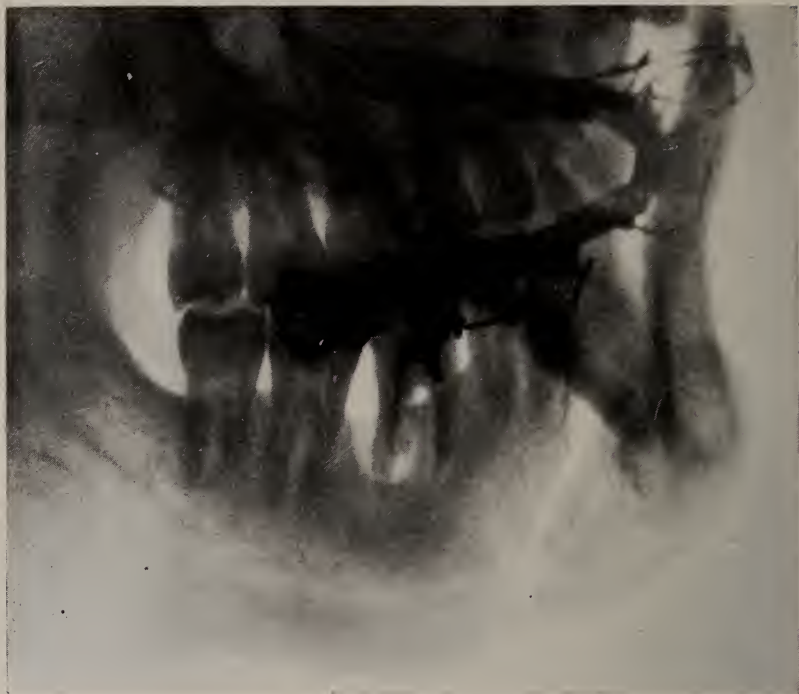


Fig. 47.

Fig. 47. (Case IX)—Splint in situ.

shown in *Fig. 47*, which is a Roentgenogram dated November 19, 1916, three days after the fracture. Although the molar clamp band was broken, it was possible to use sufficient wires to hold this lingual bar in place. About three of the teeth in the anterior segment were wired firmly to the splint through the holes previously made for the purpose, but after it had been inserted it was found that the teeth of the right side were not in proper occlusion. This proved that the right segment was not in correct position. Therefore, the following day, November 20, 1916, the upper and lower posterior teeth were firmly wired together, crossing the wires as shown in *Fig. 48*. It was not necessary to wire the lower anterior segment to the upper incisors since this was wired to the lingual bar.

At the time of the accident a slight wound was made upon the right side of the face. This healed very readily and after a few days the patient was dismissed from the hospital, it being unnecessary for him to wear any sort of bandage whatsoever. Except for a slight impediment of the speech one would not have known that his jaw was fractured.

At the end of about four weeks the interdental wires were removed. It was deemed advisable at the time, however, to leave the lingual

splint wired in position for another week, and on December 23, 1916, the splint was removed. The results were pleasing and satisfactory. Later on the roots of the right cuspid and of the left first bicuspid were removed and these teeth are to be restored with bridge work. Aside from a very slight scar upon the face, one would scarce know there had been a fracture of the mandible.

INTERDENTAL WIRING.

Case X: Patient was injured on March 14, 1917, and received no definite treatment until April 4, 1917, about three weeks later. *Fig. 49* is a Roentgenogram showing the line of fracture between the



Fig. 48.

Fig. 48. (Case IX)—Splint in situ to hold anterior fragment. Interdental wires on posterior teeth.

lower central incisors. In the treatment interdental wires were used. The patient had a prognathism of the lower jaw, the lower anterior teeth setting entirely anterior to the upper teeth when the jaws were closed. In wiring three sets of wires were used. Upon the right side wires were crossed from the upper first molar to the lower first bicuspid and from the lower first molar to the upper first bicuspid. Anteriorly the wires were crossed from the upper right central incisor to the lower left lateral incisor and vice



Fig. 49.

Fig. 49. (Case X)—Fracture at symphysis.



Fig. 50.

Fig. 50. (Case X)—Case wired.

versa. The lower left first molar was missing and the wires were crossed between the bicuspid on that side.

This patient was a man of massive strength, his teeth having parallel axial walls, and about a week after the wires were placed they became loosened and it was necessary to replace them. *Fig. 50* is a Roentgenogram as wired the first time. The second time additional wires were used. This is a case where particularly the services of a dentist were needed in treatment. A physician might easily have misjudged the proper position of the teeth. Before the first wiring there was wide separation between the lower incisors but when the teeth were wired together this separation entirely closed and the patient very happily stated that he was sure his teeth were in the correct position.

VULCANITE SPLINT.

Case XI: This unfortunate woman was thrown violently from an automobile on April 5, 1917. In addition to two compound fractures of the mandible there was also a fracture of the bridge of the nose, a



Fig. 51.

Fig. 51. (Case XI)—Roentgenogram of fracture.

fracture of the zygoma, a fracture at the base of the skull in the region of the foramen magnum, fractures of the spinous process of both the fifth and sixth cervical vertebra and a dislocation of one of the ribs. Yet a full upper denture, made twenty years before and worn at the time of the accident, was uninjured. The first two days following the accident it was expected she would die. *Fig. 51* is a Roentgenogram of the head and face which shows very clearly the fracture of the mandible upon the right side; the fracture of the left side being in the region of the first bicuspid. All of the lower teeth were absent excepting the six anteriors and the root of the right first bicuspid, which is shown in *Fig. 51*.

On April 9th a modeling composition impression was secured of the lower jaw and teeth. Better results in taking this impression could have been obtained if the patient would have submitted to an



Fig. 52.

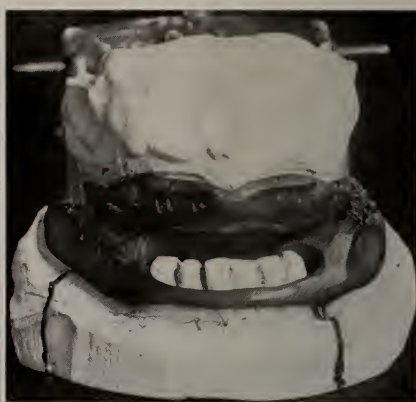


Fig. 53.

Fig. 52 (Case XI)—Casts mounted upon articulator.

Fig. 53. (Case XI)—Rubber splint ready for insertion.

anesthetic; this she absolutely refused to do. The fracture was reduced as well and as carefully as possible and the impression taken. *Fig. 52* shows the lower cast and indicates the fracture lines.

An aluminum tray was cut to fit roughly this cast, leaving an opening through the anterior for the teeth. This aluminum tray was then perforated over the posterior part. The cast was then well oiled with vaseline and soft Kerr impression material placed into the tray was forced down upon it. This was then removed and trimmed as an ordinary lower denture. Then to the upper surface of this splint over the posterior part considerable excess of Kerr's impression material was added. After this was softened the splint was placed in the mouth and a sort of mush-bite taken, attempting to bring the lower anterior teeth into what was judged to be about their correct position. This entire modeling compound splint was then taken out,

chilled thoroughly and replaced; the patient's head was bandaged lightly and this worn from April 11 until April 13, 1916.

The splint was then removed and placed upon the lower cast, shown in *Fig. 52*. Into the impression of the upper jaw upon the upper side of the splint was placed a cast made from her full denture and both mounted upon the articulator. *Fig. 52* then shows the relative position of the upper and lower jaws as obtained by this method. A vulcanite base was then made to fit the upper cast; also one to fit the lower cast, leaving an opening for the anterior teeth. An extra ridge of rubber was made upon the posterior part of the lower and also the upper base through which holes might be bored for the purpose of wiring the two bases together. Holes also were bored in the anterior portion of the upper splint. The bases were then taken to the mouth and inserted separately for trial. A little filing of the posterior part was necessary before they finally came into the position shown in *Fig. 53*. They were then removed and wired together through the holes made for the purpose and the final insertion of the splint made.

Fortunately the left cuspid and central incisor carried ill-fitting gold crowns. Under the cervical margins of these crowns it was possible to tie strong orthodontic ligatures; these were then brought up through the anterior bar of the lower splint and tied through the holes made in the upper base. These cords drew the anterior teeth up into the lower splint and held them firmly. It was only necessary to change these cords once during the time this splint was worn. The patient absolutely refused to wear a bandage from April 15th, the time when the vulcanite splint was inserted, to April 26th, about eleven days. She made an effort to hold the splint and her jaws in proper position by placing her thumb under her chin during her waking hours.

There was very little swelling of the face externally, but there undoubtedly was an abscess on the right side at the right fracture line which discharged into the mouth. The space between the incisal edges of the lower anterior teeth and the upper vulcanite base was ample for feeding and for cleansing of the mouth. On May 14th the splint was removed, having been worn four weeks. The points where the mucous membrane had been torn and the ends of the bones exposed were entirely covered over with new and apparently healthy mucous membrane.

A Roentgenogram taken April 26th, eleven days after the insertion of the vulcanite splint, is shown in *Fig. 54*. It may be seen from this that the bones of the left side were not in good position. The apposition of the right side was fairly good. The patient absolutely refused to permit a readjustment of the splint to correct the improper position of the left side. She did, however, at that time permit the use of a bandage. It was thought that possibly the dis-

placed fragment might be forced up into position by applying pressure over that point. Upon removal of the splint the patient felt well satisfied with the result. Although the point of the chin was not quite as prominent as it had been formerly, the deformity was not great. It would be difficult indeed to suggest a method by which the bones in a case of this kind might be held in correct apposition without surgical wiring. This method was eliminated by the patient's refusal to take an anesthetic, and after all, possibly the choice was best, for had that been done she would have carried two unsightly scars. The original upper denture was placed in the mouth after



Fig. 54.

Fig. 54. (Case XI)—Roentgenogram of case with splint in situ.

the splint was removed and although the lower teeth did not meet it as well as before the accident, the result was not unsatisfactory.

About a week after the splint was removed apparently an abscess formed upon the right side. This, however, subsided without lancing, undoubtedly discharging through the mucous membrane of the mouth. Six weeks after the date of the accident the patient left for her home in another city.

SUMMARY.

The knowledge gained from a very limited experience in the treatment of fractures of the mandible might be summarized as follows:

AIMS OF TREATMENT.

There are three ultimate things to be accomplished in the treatment of cases of this kind. First and most important is the union of the fractured parts; second, the restoration of correct occlusion of the teeth, and third, the avoidance of facial deformities.

BONE WIRING.

This method of treatment was used formerly more than now. Silver wire was used and this later removed. The objections to this method of treatment are: First, the wounds invariably become infected; second, fractured parts are not always held firmly in their correct position; third, unsightly scars upon the face, in some cases.

DENTAL APPLIANCES.

Fractures of the mandible may be handled with more ease and satisfaction by the use of dental appliances. Orthodontia bands and arches are indicated in many cases and prove a very satisfactory method of treatment. Interdental splints are especially indicated in cases where all teeth are present. Their retention by the use of a Barton bandage is satisfactory but in many cases wiring of the teeth in addition over the splint would eliminate the necessity of a bandage, and this is desirable. A little experience with splints of gold and platinum leads me to especially recommend their use. They are very easily constructed, very easily readjusted when necessary, are less bulky than splints of aluminum or vulcanite and their actual cost of construction not great considering the return of the metal. The average time consumed in the construction of a gold and platinum interdental splint probably would not exceed five or six hours.

Interdental wires are especially valuable in the treatment of cases of this nature, and particularly so when one or two teeth are missing, to permit of proper feeding of the patient. Care should be taken, however, that no solid or semi-solid material is in the stomach at the time of application of interdental wires for fear of nausea and vomiting. The result, of course, might prove disastrous.

Finally, after careful study of each case, one's own judgment must determine what is the correct method of treatment. There can be no doubt that this work properly belongs in the field of the dentist because of the mechanical skill and ingenuity demanded.

RETENTION OF TEETH.

Many times teeth which it is known will be lost after treatment has been completed may be retained temporarily to serve a definite purpose. The extraction of loose or abscessed teeth, or even those directly in the line of fracture, may be a mistake because of the ingress of saliva. Often they may be retained temporarily for the

purpose of holding the fractured bones in their proper position. Later on, of course, these may be removed.

HOSPITAL.

Cases of fracture of the mandible may be best handled in a hospital. The patient should at least remain there for the first ten days following the accident and very often other bodily injuries make this imperative. The fact that the feeding of patients is really a serious problem at times makes it imperative that they be where the food and diet may be watched very carefully.

FEEDING.

Usually liquid foods must be given. Milk, broth, soups, egg-nogs and in fact all liquid foods of a high nutritive value may be administered. In cases where interdental splints are being worn sometimes semi-solid foods may be given. During the treatment the patient generally loses a great deal in weight due to improper nourishment. In fact, a surgeon of very high standing stated that it had been his experience that it was not uncommon for patients to die because of their inability to obtain proper nourishment.

THE CARE OF THE MOUTH.

Since suppuration follows in nearly every case, owing to the ingress of saliva, particular care must be given to the proper cleansing of the mouth. Compressed air spray or atomizer may be used with many mild or bland antiseptic solutions. Dobell's solution is very commonly employed. Potassium permanganate also is of high value. There could be no objection to the use of peroxid of hydrogen, not particularly for its antiseptic value, but because of its mechanical cleansing action.

SUPPURATION AND CALLUS.

It is very rare for patients to recover, especially in cases of compound fracture, without formation of an abscess at the point of fracture, sometime during the course of treatment. Many times these abscesses will break into the mouth of their own accord and drain without any particular discomfort to the patient. Oftentimes they are formed and become of such size that it is necessary to lance externally. All cases should be handled in conjunction with a surgeon who may supervise this part of the treatment. Whether suppuration interferes with the formation of callus is sometimes disputed. Clinical evidence seems to show that it does not in many cases interfere materially. Possibly it forms in spite of the infection.

Callus generally forms in from four to six weeks, depending upon the age and condition of patient. When appliances are removed very often there is a slight spring or mobility of the parts. This should not give alarm, for a fibrous union has taken place and time must elapse before a hard, firm callus is formed.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE APPLICATION OF LOCAL ANESTHESIA IN DENTISTRY.

Anesthesia in all its branches has been a subject of much interest to dentists for many years. Medical records give credit to dental investigators for their success with such preparations as nitrous oxide and its allied preparations. The fact is, however, that few dentists to-day concern themselves with any means of alleviating the pain of dental operations, except that secured by reason of the application of local anesthetics. Continuous anesthesia by any method of inhalation does not appeal to the dental operator, except in odd cases, because of the intimate connection of the mouth with the respiratory passages, making operations difficult. Added to this is the unpleasantness attendant upon the administration of general anesthetics. The routine of a busy practice is an excuse for evading such cases.

Local anesthesia is the substitute upon which many of us are obliged to rely. This is a branch of dentistry which seems to have received altogether too little attention. Owing to lack of skill in the department, many dentists force their patients to experience much pain and suffering that could easily be avoided with skillful use of the needle. Modern methods of anesthesia by induction go a long way towards destroying the fear of the dentist's chair.

With a view to aiding us in our study of this subject, P. G. Puterbaugh, M.D., D.D.S., Chicago, prepared a paper for presentation before the Chicago Dental Society, November, 1917, entitled, "Indications and Practical Applications of Local Anesthesia in Dentistry." This paper is reported at length in the February issue of "Dental Review." The author traces the history of anesthetics from the earliest records to the present modification, such as novocain and like preparations. He finds that novocain is the ideal preparation for local anesthesia, because it is non-toxic in the required dosage, non-irritating to the tissues, stable enough to withstand sterilization by boiling, and is capable of uniting temporarily with nervous tissue in a manner to produce an anesthesia that is absolutely satisfactory to both patient and operator.

In preparing the solution of novocain, freshly prepared distilled

water must be used. Distilled water deteriorates upon standing. A container filled with distilled water will after a time show signs of a flocculent precipitate, such action being brought about perhaps, by the action of light, bacterial organisms or chemical salts entering into the composition of the glass retainer. Anesthetics prepared from stale distilled water have been observed to cause more irritation to the tissues than do freshly prepared ones.

Body tissues contain normally a definite percentage of crystalloid material in the form of salts, chlorides of sodium, potassium, and calcium. The bathing of these tissues in unmodified distilled water causes a swelling of the individual cells, due to the disturbed osmotic balance. This is a fact to be recognized by those who administer local anesthetics, because, says Dr. Puterbaugh, "the disturbance within the cells composing any tissue injected with a hypotonic anesthetic solution is in itself sufficient to account for much of the smarting pain, swelling and after soreness so frequently observed following the administration of certain widely advertised proprietary solutions. These disagreeable symptoms may be avoided by the addition of the proper amount of salts to the water, rendering the osmotic balance equal to that of the human tissues. The so-called Ringer solution fills this need satisfactorily, having the formula of:

Sodium Chlorid	0.6 per cent.
Calcium Chlorid	0.4 per cent.
Potassium Chlorid	0.2 per cent.

For convenience in compounding, the ingredients in proper proportions have been incorporated in tablet form by various pharmaceutical houses, rendering the making of the Ringer solution a very simple matter. This solution may be injected hypodermically without pain, discoloration, edema or after soreness, save that resulting from the introduction of the needle, because it does not disturb the osmotic balance of the cells with which it comes in contact and is positively non-irritating when freshly prepared."

Novocain, a synthetic preparation, is a white powder, freely soluble in water. Is a vasodilator to a very slight degree, but suprarenin overcomes this. Novocain combines temporarily with the nervous system in such a way as to cause a suspension of its activities, but leaves no ill effects when it goes from the tissues.

Suprarenin, "which introduced into the circulation, causes an increase in the force and frequency of the heart action, accompanied by a marked rise in blood pressure, due to a direct action upon the musculature rather than to stimulation of the central nervous system. Locally it constricts the smaller blood vessels by direct stimulation of the circular muscle fibres in their walls. Suprarenin if administered in an overdosage produces the quite characteristic and distressing signs and symptoms of precordial pain, air hunger, dizziness, a very full and often intermittent pulse, headache, etc. These symptoms

come on very suddenly, but are transient, lasting only from three to ten minutes, and are those of an over-stimulation and increased blood pressure, but are not followed by periods of depression, such as is observed following cocain toxemia."

The ideal novocain solution contains, freshly distilled water as a vehicle, one to two per cent. novocain as an anesthetic, sufficient chlorid of sodium, calcium and potassium in the form of a Ringer tablet to render the solution esotonic with the body fluids, sufficient suprarenin to localize and retain the anesthetic mixture in the locality. It has been found that the tissues do not suffer as greatly if the solution to be injected is first warmed. Then, too, we must not use too great a force in driving the solution into the tissues, it being better to use little pressure on the needle and take longer time for the operation. Tincture of iodine, U. S. P. 7 per cent., should first be applied to the tissues at the point where the injection is to be made. This both sterilizes the part and renders the pain of the needle injection less severe. Time is an important factor in the administration of local anesthetics. Operators commonly display too much haste after the solution has been passed into the tissues. From five to eight minutes is the time required for most preparations to do their work.

Local anesthesia may be classified under two heads, viz.; *Infiltrative*, that is "the application of a local anesthetic agent to the distribution of sensory nerves, thus paralyzing their ending and their power of receiving impressions," while *conductive* anesthesia "consists of the injection of a local anesthetic solution into the region surrounding a sensory nerve trunk, thus paralyzing its power of transmitting afferent impulses sent up from its area of distribution."

To the beginner, the infiltration method will give best results, but it is claimed by many that as his experience grows he will gradually adopt the conductive method, because the results will be more far reaching and effective. For an intimate review of these two methods the reader is advised to refer to the full report of Dr. Puterbaugh's paper.

American Institute of Dental Teachers

AT the last annual meeting of the American Institute of Dental Teachers, held at Pittsburgh, Pennsylvania, January 29-31, 1918, the following officers were elected:—President, Dr. A. W. Thornton, McGill University, Department of Dentistry, Montreal, Que.; Vice-President, Dr. R. W. Bunting, Ann Arbor, Mich.; Secretary-Treasurer, Dr. Abram Hoffman, 381 Linwood Avenue, Buffalo, N.Y.; Executive Board, Dr. A. D. Black, Chicago, Ill.; Dr. G. S. Millbrey, San Francisco, Cal.; and Dr. A. H. Hipple, Omaha, Neb. The next annual meeting will be held January 28, 29 and 30th, 1919. The place of meeting to be announced later.

Mercurial Stomatitis, Prophylaxis and Treatment*

BY CAPTAIN J. H. REID, C.A.D.C.

IN discussing the subject of Ulcerative Stomatitis, I wish to refer to an inflammatory and ulcero-membranous condition which has in some cases been produced by mercury.

The mercury which is taken into the system by injection, has an irritating effect upon structures in the oral cavity, and therefore excites the spirilla and bacilli which are present in the mouth, thus bringing on Stomatitis. It is my intention to refer briefly to the history, symptoms and treatment of cases which have come under my care in a Canadian Military Venereal Hospital. I also desire to emphasize the importance of prophylaxis for patients who are commencing treatment for syphilis.

In some instances, men who are admitted to this hospital for the treatment of "V. D. S." have reported to me with quite a marked inflammation and ulcerative condition of the mouth. I have found that the symptoms frequently follow, after the patient has received three or four injections of mercury. It is known that this drug seems to have a selection for the oral cavity, and it therefore bears its influence upon the mucous membrane, the jaws and adjacent structures of the mouth. Stomatitis must certainly be solely dependent upon the teeth; for those patients who have previously suffered from the loss of their teeth are never affected.

It has been my usual routine of late, to examine the mouths of men who have been admitted to hospital, and whose conditions have been diagnosed as syphilis. I find it most necessary to prepare them, prior to their treatment for this disease, by giving them a sufficient amount of dental attention and prophylaxis and at the same time educating them as to the importance of the subject of oral hygiene. Scrupulous cleanliness of the mouth and teeth should be insisted upon, especially during their stay in a Venereal Hospital. It is quite evident that a number of the men being admitted here have not been properly educated along these lines. If the teeth are well looked after before commencing treatment, a stomatitis will seldom become severe. This fact I have generally verified during the patient's course of treatment. Having tested some numbers of cases, I frequently find that the men who present themselves to me with symptoms of ulcerative stomatitis, are those who have been previously neglectful in caring for their teeth. In the mouths of these patients I generally find one or more local irritants. These may

*Read at a Meeting of the Etchinghill Clinical Society on December 12th, 1917, and published in Oral Health with consent of Canadian Army Dental Corps.

easily be the means of setting up an inflammation. At this stage the patient should be taken in hand and given the necessary dental attention, otherwise the mercury which is given induces local congestion and irritates the vessels, thus exciting the bacterial organisms which are dormant in the mouth. As a result the patient suffers with an Ulcerative Stomatitis.

SYMPTOMS.

The symptoms manifested in the mouth are similar in every respect to those found in Vincent's Ulcero-membranous Stomatitis. The organisms are the same.

For the first day or two the patient has an increased temperature. He loses sleep and has at times a feeling of lassitude. His vitality is lowered. An inflammation and redness of the tissue exists, with often a swelling of the gum margins. In the more severe cases a slight sloughing of the tissues occurs in this region. This seems more apparent in the interproximal spaces of the teeth. White ulcerative patches may appear almost anywhere on the mucous membrane. The patient experiences a disagreeable taste and the breath is foetid. This is very characteristic. The mouth is generally sore. There is a swelling of the sub-maxillary glands and an increased flow of saliva. Mastication of food is often quite difficult even when the softest food is taken.

There are three factors which come into play and seem to increase or keep up inflammatory changes in the mouth. These are: (1) Bad teeth; (2) Excessive smoking; (3) Alcohol, and they most certainly tend to hinder or retard the process of prophylactic treatment. It is most advisable that carious teeth be filled and ill-fitting crowns and bridges examined, as these very often become a source of irritation. Patients should abstain from both alcohol and tobacco while being treated.

The cases which are brought to my attention for treatment, although troublesome and distressing, are very rarely serious. I have seldom seen instances where teeth have become loosened and finally lost as a result of this disease. Syphilitics do not as a rule show the advanced symptoms of Ptyalism under mercurial treatment, such as excessive salivation (drooling), tongue and parotid glands enlarged, teeth loosening in their sockets, sloughing away of tissues and necrosis of bone. The dosage of mercury is properly regulated, and although it may cause a Stomatitis, it seldom, if ever, shows any further symptoms of a serious nature. It is said that Mercurial Stomatitis is the most valuable guide by which to regulate the dose of mercury.

It is not absolutely necessary to discontinue the administration of the mercury, owing to the presence of this pathological condition of the mouth; but the patient should be given instructions to co-

operate in every way with the dentist, in order that the teeth may be cared for, and the mouth kept clean during his treatment. It is absolutely useless to prescribe antiseptic mouth-washes for such patients, without the necessary prophylaxis and dental attention

TREATMENT.

The following should be observed in the process of treating cases:

It is essential to first remove any local irritants which would tend to arouse or excite pathological conditions. This would include the removal of hard and soft deposits of salivary calculus and the extraction of loose suppurating roots. The patient may have intense local pain upon first presenting himself, and owing to this it is not always advisable to remove the irritants at the first sitting. However, this can generally be quite easily done at the next sitting, usually without any unnecessary pain to the patient. Having done this the entire mouth should be sprayed with a warm saline solution. The infected tissues of the mouth should then be wiped off with cotton dipped in Hydrogen Dioxide, taking as much of the friable membranous coating off as possible. This leaves a freely bleeding surface, which should be next dried off with absorbing cotton. The infected parts are now free from saliva and should be sprayed with a mixture composed of equal parts of Liquor Arsenicalis and Vinum Ipecac. Some operators advise the addition of Aromatic Sulphuric Acid to the mixture. If this is done care should be taken that the infected parts only are sprayed. The lower parts of the throat should not be sprayed with the Aromatic Sulphuric Acid mixture. Before dismissing the patient the ulcero-membranous tissues should be painted with a solution of iodine. Some operators advise that an astringent mouth wash be then prescribed for the patient for use at home. I have not yet used this method of procedure. It is not necessary to prescribe highly astringent mouth washes, as only the infected parts need to be stimulated to healthy activity, and not the entire mucous membrane. Soft diets should always be recommended for those suffering with Ulcerative Stomatitis.

From the above method of treatment I have had an average recovery in from six to eight days.

In conclusion I wish to emphasize the fact that prophylactic measures should be strenuously carried out. This includes the thorough and correct method of brushing the teeth, I should say three or four times daily. This should never be neglected while a patient is undergoing treatment for syphilis. Buckley states that Syphilographers have learned from sad experience, that mercury can be pushed much farther in the treatment of syphilis, without producing Ptyalism, if the mouth has first been placed in a hygienic condition

PRO BONO PUBLICO

This Department is edited by **Fred J. Conboy, D.D.S.**, and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Dentistry—Dyspepsia

ONE of the most foolish and costly habits which men and women acquire is that of swallowing their food without chewing it. There are two causes for this habit. It is a habit, and is not natural. Nature has provided machinery for the very opposite, and Nature does not make anything like as many mistakes as men and women do.

The first cause is peculiar to men, and particularly business men. In the hurry of present-day business they imagine they have no time to waste at meal hours. Somebody—one of the insistent, thoughtless, dreadfully exacting public—is there at noon hour—when he should not have been—and business must be attended to. Competition and the banks make it necessary—the banks especially. So our young business man just gulps his lunch down and away. A little of this and chewing becomes quite unnecessary. Why, the stomach is doing it alright. Of course it does for a time, almost as good as if it was lined with teeth. A cup of hot tea gulped down easily takes the place of saliva. Providence supplies the saliva and Ceylon the tea. It is surprising under such circumstances, but a fact, nevertheless, that many of us prefer by habit the product of Ceylon. If we have any regard for our future well-being we will never allow food to reach the stomach until it has been fully chewed and sufficient saliva incorporated therewith. The former will always produce the latter.

The second and most common reason for bolting food is common to all people. This reason is either sore or lost teeth. Even little children are affected by it. When children start to lose their first teeth, the new tooth comes up under the old tooth, and between the two there is a cushion of very sensitive tissue. It hurts to bite on the old tooth, and so the child swallows without chewing. A little later in life a tooth starts to decay. Tooth decay is the most prevalent of all maladies. We have almost all had this trouble. As soon as a cavity appears it hurts to bite on it. Anything sweet, sour, salty, hot or cold gives pain as soon as it comes in contact with the

affected tooth. Then what happens? Instinctively we shift food to the other side of the mouth. If in the process of "shifting" we swallow it we are perfectly satisfied. It never seems to occur to us that we are not playing the game square with our stomach. Every man or woman on earth rebels as soon as he or she finds her friends are not playing the game square. Our stomach is one of our best friends.

Just apply an everyday rule and play a square game or get ready for rebellion. Remember this, you have to do one of the two things. There is no escape.

Now, the most rational thing is to get those sore teeth properly treated and filled. In treating your teeth you are also treating your stomach, and through it your whole body. Why suffer so much when by recognized and proved treatment you can avoid so much pain and trouble and ill health? Modern dentistry looks far behind the mere cavity in your tooth and sees the effects. It then aims to prevent the effects by removing the cause. This can best be done by restoring the organs Nature gave you to the condition in which they were when Nature completed her work. Modern dentistry aims simply to restore natural organs in a natural way to perform natural functions.

Ontario Dental Society Convention

THE 51st annual meeting of the Ontario Dental Society will be held in Toronto during the week beginning April 29th, 1918.

The meeting will take the form of a post-graduate course, and will be conducted along similar lines to last year.

The committee have already been able to arrange with Dr. C. N. Johnson and Dr. Smith, of Chicago, and Drs. W. E. Cummer and A. E. Webster, of Toronto, to take charge of different sections of the course.

Every dentist in Ontario should plan to be in Toronto during the O. D. S. week. The meeting will be practical and very much worth while.

Back Numbers of Magazines Wanted

THE following magazines are urgently needed by Dr. W. E. Cummer, 2 Bloor Street East, Toronto. Dr. Cummer states that he will gladly pay well for the copies indicated:—

Bulletin California State Dental Association, April, 1917.

Pacific Dental Gazette, March, May, 1916.

Oral Health, Vol. 1 (1911) all copies.

Oral Health, Vol. 2 (1912) all copies.

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, MARCH, 1918

No. 3

EDITORIAL

The X-Ray in Dentistry

DENTAL practitioners are frequently heard to remark that the practice of modern dentistry has become so very exacting, and the responsibilities of failure so great, that all pleasure in the conduct of a dental practice has completely vanished. It is argued that a thoroughly conscientious dentist, in the light of present day knowledge, carries a heavy burden because of the possibility of a patient being dismissed with local dental foci of infection, which may result in very serious illness or even death. Observation, however, leads to the conclusion that many who are thus "worried," have almost entirely ignored that most important dental office requisite, the X-ray. Little wonder the conscience is troubled, because of the uncertainty of results and the knowledge that every known device has not been used to render the most skilful service possible.

We make no extravagant claims for the shadow-picture machine. It is not infallible. But for checking up root canal treatments and fillings, it is, to our mind, quite indispensable. What justification has any dentist for charging a patient for the most skilful service, and yet continue filling root canal after root canal, without knowing

they are properly filled, and failing to take advantage of every possible means to learn the facts?

Those dentists who regularly use an X-ray machine have established a new and better standard of service. The conscious knowledge of having rendered the best possible service, results in the real joy and pleasure, without which dental practice is nothing but a grind. The practice of dentistry to-day certainly involves greater responsibilities, but it also involves better service and more satisfying results. If an X-ray machine were used for nothing else than producing skiagraphs of root canal fillings, it would more than justify its use, in pleasure and satisfaction to the dentist.

At the outset, the X-ray should be recognized as a dangerous machine when in the hands of a careless or ignorant operator. Before undertaking its use the operator should give special study to the whole subject and thoroughly master the technique of operating the particular machine employed.

It should also be recognized, that if an intelligent conclusion is to be arrived at, the significance of varied degrees of shadows, or the absence of shadows, are not of themselves to be taken as conclusive diagnostic evidence, but must be considered along with all of the clinical facts in the case. In other words the X-ray, while a most valuable aid to diagnosis, is only one of the links in the evidence, and is only of value when considered as such.

For diagnosis, studying rarified areas, and the intelligent practice of modern dentistry, the X-ray has made for itself a permanent place in dentistry. Why not recognize the fact before your patients commence asking you,—Why?

Request Made for Fifteen Officers and Fifteen Sergeants, C.A.D.C. Overseas

ABOUT the 1st of February the Militia authorities received a request for a draft of fifteen graduate dentists and fifteen laboratory assistants for service in the Canadian Army Dental Corps Overseas. These men will be sent over as soon as the draft is organized and provision made for transportation.

Lieut.-Col. F. T. Coghlan Honored

LIEUT.-COL. F. T. COGHLAN, who practised in Guelph for many years, has been awarded the Distinguished Service Order. Dr. Coghlan graduated from the Royal College of Dental Surgeons in 1893, and has occupied many positions of responsibility and trust in the Dental Associations of Canada.

Dental Inspection in Ontario Schools Recommended by Elgin County Trustees

AT the last meeting of the Elgin County Trustees' Association, Inspector Taylor introduced the subject of Dental and Medical Inspection of rural schools, urging the desirability of the Government taking action with a view to obligatory inspection.

Inspector Taylor pointed out the necessity for immediate action as there has been so much human waste through the war that it is necessary to conserve human life in every way possible. Mr. Taylor considers that this is the century of women and children; that the child is the ward of the state and is therefore entitled to have medical attention at the state's expense, since the state compels the child's attendance at the school; that sickly and backward children hinder the progress and congest classes; that sound logic calls for a standard of physical efficiency in the child as well as the teacher, and that after the war immigrants' children will imperil the health through the diseases that they would inevitably introduce.

The County Trustees' Association passed a resolution memorializing the Ontario Government to take immediate action on this important matter.

Work of the Canadian Army Dental Corps

Dental operations performed by officers of the Canadian Army Dental Corps in England and France, from October 1st to December 31st, 1917, and also showing the grand total of work completed since July 15th, 1915.

Dental Operations Performed by Officers of the Canadian Army Dental Corps In England and France from October 1st to December 31st, 1917, and Also Showing the Grand Total of Work Completed Since July 15th 1915.							
Total operations Fill- reported to ings.	Treat- ments.	Den- tures.	Prophy- laxis.	Extrac- tions.	Devitali- zing.	Total.	
Sept. 30, 1917 ..478,279	155,461	94,026	67,106	340,395	51,891	1,187,158	
October " 26,176	13,723	4,488	8,917	12,326	2,333	67,963	
Nov., " 27,163	14,169	4,613	5,470	12,948	2,342	64,705	
Dec., " 22,752	12,779	3,831	5,230	9,045	2,166	55,803	
Grand Total ..554,370	196,132	106,958	86,723	372,714	58,732	1,375,629	

Dentists to be Granted Leave of Absence Until Serv- ices Required in C.A.D.C.

A MILITIA Order has recently been issued providing that physicians, dentists and veterinary surgeons ordered to report for duty may, on reporting, be granted immediate leave of absence without pay, until their services are required as officers.

Lieut. H. O'Rourke Recommended for V.C.

LIEUT. HAROLD O'ROUKE, First Year Student of the Royal College of Dental Surgeons, of Ontario, who went overseas with the 180th Sportsmen's Battalion, has been recommended for the Victoria Cross, the highest decoration to be gained on the field of honor.

Officers, Manitoba Dental Association

Board of Directors.

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Captain MacNevin Deceased

WE regret exceedingly to report the death of Captain William Gordon MacNevin at Cottage Hospital Sanitarium, Gravenhurst, on Sunday, February 3rd, 1918. Captain MacNevin was twenty-four years of age and graduated from the Royal College of Dental Surgeons in 1915.

Captain MacNevin originally enlisted as a gunner with the 26th Battery, C. F. A., going overseas in June, 1915, and subsequently transferred to the Canadian Army Dental Corps, going over to France in November, 1916. After serving in hospitals there as O. C. of the Dental Clinic, he was compelled several months ago to return to Canada because of the condition of his health.

Captain MacNevin's home was in Goderich, and his many friends throughout the Dental profession extend to his wife and other members of the family sincerest sympathy.

CEMENTING AN INLAY.—In cementing a gold inlay, malleting the inlay by using a stiff, strong orange-wood stick will give excellent results in seating inlay. This method is followed by rigid burnishing, and finally having patient put full strength of muscles in closing teeth after a piece of orangewood about one-eighth inch long and squared on all sides has been placed on the inlay. This throws full pressure on the inlay, tending to drive inlay further to place, and overcomes any possibility of heaving while cement is crystallizing.—*W. D. N. Moore (Dental Review).*

Personal Sketch—Weston A. Price

(Announcement of Kansas State Dental Convention)



“*TO meet him personally, he is a quiet, unobtrusive gentleman. He is delightful as a companion and friend. He is a good listener; but after you have talked to him for a while you find that he has listened with his ears and his eyes as well. It suddenly dawns upon you that his mind, while listening to what you were saying, has galloped on ahead classifying and summing up his conclusions. He is one of the large brains of the dental profession. The success of the establishment of the Research Institute of the National Dental Association, is due more largely to him than to any one other man. He is sacrificing his time and energy for its success more than any other one man. It is not for self-glorification in the smallest degree; but that our profession may better serve humanity. He is a man with a purpose and a mission added to vision of great things for dentistry of the future. He is considerate of the thoughts and wishes of others. He has a great sympathetic heart and undaunted courage. He is a splendid teacher and always has more to say than there is time for. We count it a great blessing to know him as a friend. He is the finest type of a Christian gentleman and one of the few men with plus energy.*”

—Frank O. Hetrick, D.D.S.



WESTON A. PRICE, M. S., D. D. S.
*President Research Institute of The National Dental Association.
Cleveland.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, APRIL, 1918

No. 4

The Relation of Dental Operations and Dental Lesions to Systemic Lesions*

DR. WESTON A. PRICE, CLEVELAND, OHIO.

MEMBERS of the Toronto Dental Society, I assure you it is a great pleasure to come home. I always feel I am coming home when I come to Toronto.

We shall study together to-night three or four phases of this great problem of the relation of dental operations and dental lesions to systemic lesions. I will ask you to study with me first the relation of the medicament that we shall use in the sterilization of teeth to the results that are obtained with that procedure. I am very sorry that I cannot bring you a more encouraging and hopeful message so far as it relates to the procedures of the past. It has been a very great disappointment to us in making these researches to find that many of the things that we thought were so, are apparently not so. I say "apparently" because it is always within the range of possibility that there is some new phase of this problem we have not understood, we may not have made a sufficiently large number of experiments, we may not have checked our work carefully enough. However, we will leave it for you to be the jury, and I simply present to you the evidence as we have it, and you will make your own conclusions.

We were discussing at the dinner table this evening whether or not we are, any of us, free from the influence of superstition, when I suggested that one of the shocks that came to me recently, was to find that some fourteen thousand observations had been made to see whether there was any truth in the generally accepted phenomenon

* Address delivered at a meeting of the Toronto Dental Society, at the Carls-Rite Hotel, on Monday Evening, 11th March, 1918.

of mental telepathy, and that these demonstrate that the number of instances in which there was really a transference of any impression whatever from one mind to another, was precisely that which would be expected to occur according to mathematical chance. If now, a thing we have accepted so universally as that, is not based on fact, how readily it may be true that some of the things that we have much less evidence regarding may not be based on fact?

We have undertaken to study the relation of the tooth to the patient, first, then later, the relation of the patient to the tooth; and in this large series of experiments that we shall report, we have tried, if possible, to ascertain where the infection exists in dental structures, how the infection may be destroyed, what effect the various medicaments, we are in the habit of using, have. And as I stated we have been exceedingly depressed to find that so large a number of medicaments were practically worthless; which simply is another way of saying, we, as a dental profession, have been taking a great deal of credit to ourselves that should have gone to nature. She has accomplished the splendid results she has, not because we sterilized teeth, but in spite of the fact that we do not. That is really a compliment to nature, and it is a compliment to our bodies, and when we come to have that fact entirely settled into our systems, we will have a greater respect for our bodies than we had before, because we realize that if nature can do all of that in spite of some infection, how much better she will do when we are able to do our work without infection; however, that time probably will only come when we shall all be practising prophylaxis successfully.

THE RELATION OF MEDICAMENTS TO THE STERILIZATION OF TEETH.

We have undertaken first to determine whether or not the medicaments we are in the habit of using can sterilize an infected dentin and cementum under the most ideal and favorable conditions. We have therefore taken a large mass of medicament and a small quantity of tooth, relatively. In other words, we have taken our infected tooth and immersed it in a large quantity of medicament and allowed the medicament to attack the organism from within the tooth structure as well as from without, for in each case the medicament was pumped into the open canal, and the canal was always opened through the apex.

This is the report of Mrs. Mauldenhauer Brooks and myself on the medication of tooth structures which we gave at the National Association meeting in New York in November, and I want you to think of Mrs. Brooks as being the technician who did this work in detail under my direction and did it very efficiently indeed. It was published in the Journal of the National Dental Association issued about March 1st.

The first experiment I will report, took three thousand teeth opened through the apex in that way. The medicaments used were those in common practice, and I think something like 110 different solutions were used for the test. Many of these were different percentages of the same medicament; and I shall endeavor to show you how utterly inefficient these various medicaments are to sterilize tooth structure (even under the most favorable circumstances), and we will later see the great disadvantage they have to labor under when they are being used in the mouth.

I wish in the first series to call your attention to the fact that many of the medicaments act as depressants to the growth of the organism; they inhibit, we say, and they do not necessarily kill the organism, but they delay its growth. I shall ask you to note first the medicaments used: phenol, formaldehyde, iodine, chloral, etc. The number of teeth used in each case was ten. There were three series of cultures made, the first was a mixture in the mouth, the next was a pure streptococcus taken from the dentin of the mouth, and the third one a mixed culture. Note the number of hours: 24, 48, 72, 96, 120, 144, 168; then the eighth day, ninth day, eleventh, thirteenth, fifteenth day. Some of the medicaments held back the growth so that it did not appear until the seventh day. When we used series No. 2, which is the pure streptococcus, only one of the tubes was found growing-out on the fourth day, and on the sixth day two tubes, and as you go down through the series you find some growing-out even as late as the fifteenth day, showing you that the inhibiting effect of the medicament may last for days and days, and we may think we have a sterile condition, but it is not.

Then we have iodine and creosote, copper sulphate, iodoform, oil of thyme, hydrogen dioxide, oil of acacia, thymol, lysol, bichloride of mercury, etc. Now again we find many of these tubes growing-out late, as for example, oil of cloves, 25 per cent. solution, on the ninth day, again showing the marked inhibiting effect; and this again with oil of thyme on the ninth day. That inhibiting effect may be very misleading to us. For instance, if we had filled the tooth to which I have referred before the ninth day and had made cultures and had determined that our tooth was sterile because of the result of that culture, we might be misled into thinking we had produced a sterile condition when we really had not. Then you notice we have some growing-out on the thirteenth day.

Again when we come to eucalyptol oil and creasote we note the marked inhibiting effect, some of these growing-out on the sixth, seventh and eighth days.

Then we have the acids, hydrochloric, sulphuric and nitric, showing they did not have the inhibiting effect. With the acids the teeth were not saturated for the 24 hours. They were put in the solution of acid for a period of time (I think it was ten minutes for each tooth

approximately), showing that the acid had not in ten minutes' agitation in the canal destroyed the organism.

We have arranged the same information in a different form so that you can see the percentages. We put the acids at the top. There was a zero efficiency for the various cultures until you come down to phenol and the 24-hour group. The five per cent. solution showed 30 per cent. efficiency, 100 per cent. with pure streptococcus and 80 per cent. with the second mixed. Formaldehyde shows 100 per cent. in nearly all its strengths. That is important for you to remember, and even down to one per cent. Iodine shows greater efficiency at five per cent. than at seven; chloral, phenol, creosol and formalin show a high percentage; iodine and creasote not as high as we would have expected; chloral-hydrate shows a rather high percentage. If you go over the list you will see what a large number of them fall below 50 per cent.

Then in the next series we have arranged the same information in order of percentage efficiency only. We have first the various chemicals that produce 100 per cent. efficiency under ideal conditions for the medicament. At first glance you will be encouraged because you will think that represents the majority of the drugs, but as a matter of fact the majority are of zero efficiency; which are coming to. Under 90 per cent. three or four, eighty per cent. three, etc. In the next series they range from 70 to 50, 40, 30, 20, 10, and you will see at a glance many of your favorite medicaments in the low percentages, but I suspect more of them will be shown in the next series which will give you those with zero efficiency, and that is where the majority of them belong. The medicament had ideal conditions, because we had a large quantity of it, we saturated the tooth in it for 24 hours, (except in the case of the acids), and the quantity was large in proportion to the quantity of tooth structure.

We then took twenty of the best drugs of the 110 and made determinations to find whether or not the medicament could even keep a sterile dressing sterile, if the sterile dressing was put in an infected tooth. We took our sterile point, saturated it with the medicament, put it inside the infected tooth, when the tooth was not surrounded by an infected culture medium, and the result was that the infection from the tooth came out of the tubules and overcame the sterilizing effect of the medicament, so that the organism was actually found in the dressing. Our dressings were cut into four pieces numbering from the apex, and even without a periapical infection, creosol, creasote, formalin, concentrated phenol compound, and dichloramin-T, were the only ones that produced any sterilizing effects at all.

You next see the result of the difference between a five-hour, a twenty-four hour and a forty-eight hour treatment. You see how very much better it is to treat a tooth for 5 hours than for 24 hours, and it is worthless to treat it for 48 hours. If anyone will take the

trouble to use a little simple experiment, (for it was this thing that led me to have our Institute carry out this particular line of work), he will find it interesting, namely: put any dressing in any tooth whatever that is infected, and leave it in that tooth for 24 or 48 hours, and if you have the right culture, medium, if there is not a growth, from that root dressing material, you will have a different result from any results that I have ever gotten. I have never once removed a dressing from an infected tooth, where I had reason to believe the tooth was infected—and I think we can't have an infected tooth without having an infection beyond the apex to some extent unless the apex is entirely sealed—I say I have never once removed a dressing and cultured it, that had been in a tooth for 48 hours, that did not grow-out a live culture. So phenol compound left in the tooth five hours showed 70 per cent.; if left in for 24 hours, 15 per cent., and for 48 hours, zero efficiency, and so on with the different compounds.

We could spend the whole evening in discussing what that means to us. It means we must change our entire system of sterilization of tooth structure.

We then made a series to determine the effect when there was a periapical infection at the apex of the tooth; and to accomplish the result we sealed over the crown of the tooth with paraffin after placing our dressing, and placed the entire root, with a small opening through the apex, in a tube, containing an infected culture medium, so that the apex of the tooth was bathed in the infected culture medium, and in not one single instance did we get an efficiency that was worth reporting. Do you realize what that means? When we took 20 of the best drugs that we knew of and put them on dressing material, that that medicine could not even keep a sterile dressing sterile, when put in an infected tooth when the apex was surrounded by an infected culture medium.

We then undertook to ascertain how much of the tooth was made sterile by placing medicament inside of the tooth, and if you follow it through you will readily get in mind the areas we have taken the cultures from. We took these same teeth that had been treated in the above way, split them in half, took cultures from areas of the cementum by drilling in from the outside, then about a millimeter from the apex, drilling into the cementum. Again after splitting the teeth we went into the fresh surface of the dentin at the area near the apex, again a millimeter and a half or two millimeters from the apex, and again towards the centre of the root, and approaching towards the crowned part of the tooth; and then we took two controls from the other side and also made a culture from the content of the pulp chamber. Go all through the list and you will have zero practically everywhere, except with formalin concentrated, where we have almost a perfect sterilization of the tooth, and also a high percentage of efficiency

with eucalyptol and phenol compound for five hours and twenty-four hours.

We then undertook to determine the efficiency or the ability of double salts of ammonia and silver to sterilize the tooth. That is the Howe method. It consists of taking a 25 per cent. solution of silver nitrate and adding to it ammonia until a precipitate is formed and then adding just enough more ammonia to re-dissolve the precipitate. That solution is pumped into the tooth and is called solution No. 1. It is followed by solution No. 2, which is a formalin solution. The formalin precipitates the silver in the tooth structure and according to Dr. Howe we should get a very high percentage of efficiency. It has the great disadvantage of discoloring the tooth; it makes the tooth as black as black can be. It is said to be a means of immediate sterilization, for you may use this treatment for five, ten or fifteen minutes and fill your root immediately, no matter how badly your tooth is infected. The efficiency of the teeth treated in that way, was 69 per cent. in the first group of cases, 78 per cent. in the second, 84 per cent. in the third and 95 per cent. in the fourth, and the difference in the four groups was, that an increasingly more perfect technique was developed for making the application. We have then, with that method, a means that is much more efficient for the sterilization of the teeth than our old methods of trying to soak the teeth with medicaments for days and weeks; but as I said it has the very great disadvantage of very seriously discoloring the teeth.

We made determinations or observations with dichloramin-T and chlorozene and had results. With series 1, 2, 3, 4, and 5, with chlorozene cream we had efficiencies up to series 4, of zero, but with four treatments on four successive days with chlorozene four per cent., we got fifty per cent. efficiency. Six treatments on six successive days, changing the medicament every day, gave us 100 per cent. efficiency. With dichloramin-T, we got 100 per cent. efficiency on three different occasions. Then why not use dichloramin-T? We seldom have had presented to us a drug with so splendid possibilities as dichloramin-T, and seldom have we had so great disappointment in that it is so powerful an irritant. I personally have never used a drug that has given my patients so much discomfort as even dilute solutions of dichloramin-T. I would not advise you to put even one per cent. solutions of it in the tooth because of the powerful irritating effect. It is exceedingly painful when used in that way. It may be that we will learn how to use it and modify it so that it will not be so irritating, but I will ask you to be very careful not to use many of the preparations that have been put out and advocated, on the basis of the general efficiency of dichloramin-T. This you know is the chemical that was presented by Dakin, and the basis of the second of the Dakin-Carroll solutions; it is very efficient when used in open wounds in the way indicated, but is extremely painful when used

in the alveolar tissues or placed into the open root apex. We should have hopes that out of this medicament will come a more efficient means of sterilization than many of those we have been using.

Now, there is one other drug I wish to report to you, or rather that I wish to emphasize, which you are already familiar with. We have all learned that formalin is efficient as a sterilizing medium, but that it is very irritating under certain conditions to periapical tissues. It is probable, however, that the reason we have had undesirable effects from the use of formalin compounds, has been because we did not use them in a way that would be compatible with vital tissues. Dr. Cameron working in Philadelphia for sixteen years now has been following out the treatment of Dr. Lane, in care of the boys at Gerrard College. He has some sixteen hundred boys under his care, and his results are superior, so far as I know, to the results of any person in the country in the use of formalin. I have seen the boys, I have gone there to study the results, and he has the wonderful record of having literally hundreds of those teeth in the most putrescent condition, treated for five minutes or ten minutes with not more than a four per cent. solution to start with, and then finishing off with a two per cent. solution of formalin, filling the root immediately after the five, ten or fifteen minute treatment with the two per cent., and having better results, if we can judge from the comfort of the patient, than any of us, so far as I know, have been having with our methods and treating by the day and week. I present that method to you with more confidence than any other method I know of to-day, not even asking you to except the silver formalin as being superior to it. It is free from the discoloration that you get with the silver and formalin — silver nitrate turning the teeth black, and it produces, contrary to perhaps your expectancy, practically no irritation to the tissues, if used in a two per cent. solution in the way indicated. Put your four per cent. solution into the accumulated debris and use it as a solvent for washing out the pulp chamber and canals, but not undertaking to put any of it through or to the apex. Follow that with a two per cent. solution of formalin. Place a hot wire into the two per cent. solution of formalin in the canals, and when the solution is raised in temperature to about 120 degrees, which will not be particularly uncomfortable for the patient, formaldehyde gas is given off rapidly and profusely and passes into the structures of the tooth. He never uses enough to flood the tooth. He carries on a pledget of cotton just a small quantity to moisten the surface of the canal. He follows that with hot air, and the warm air drives the formaldehyde gas into the tooth. Teeth treated in that way show, by his results and experiments, a very high percentage of efficiency, and our tests in the laboratory have confirmed it as more efficient than the methods we

have been using in the past; namely, saturating the tooth with essential oils, etc.

We then ran a series of controls to ascertain whether or not the various drugs themselves were free from bacterial growth. We were surprised to find that nitric acid contained an organism, that phenol two per cent. contained an organism, that hydrochloric acid contained an organism, that sulphuric acid contained an organism and that hydrogen dioxide contained an organism, and when those were put on medicated points, sometimes we got a very definite growth growing out in the culture medium even though we had used sterile culture points. The effect of the point on the medicament was such that we got, in some cases, a growth where we did not get it by putting the medicament or point directly into the medium. We had streptococci-gram, positive and negative organisms, etc., frequently. In other words, many of the medicaments carry organisms. There are organisms that will grow in a 50 per cent. solution of sulphuric acid very luxuriantly. We have supposed it was the *sine qua non* for sterilizing tooth structures. It is not. Fortunately it does kill the streptococcus quite readily, and that is the organism we are most often combatting.

Our next series of studies were some that I directed and in which I had, now Lieut. Damolos assist as technician. We got some very interesting results in determining whether or not our root fillings can shut bacteria out of sterile dentin, even if we succeed in sterilizing the tooth. Eleven sterile straight teeth were used, prepared by Dr. D., the root filled by Dr. H., and cultured by Dr. T. These teeth were autoclaved, then the root filling controlled carefully to see whether they were perfectly sterile, and they were sterile. The root filling was placed in the tooth, the crown of the tooth covered with paraffin, and the apex left exposed to the infected culture medium; just as the apex of the tooth in the mouth is exposed to an infected culture medium when we have treated and filled a tooth that has been abscessed or infected. A, which was the root canal filling near the apex, was infected in 30 per cent. of the cases; B, the dentin, in which our efficiency was ten per cent. and infection 90; C, the root canal filling the apical third, 90 per cent. infected, 10 per cent. efficiency; D, root filling middle third, 60 per cent. infected, 40 per cent. efficiency; E, root filling gingival third, 40 per cent. infected and 60 per cent. efficiency. These teeth were left for two weeks in the infected culture medium. We then took six sterile teeth prepared by Dr. D., root filled by Dr. D., and culture prepared by Dr. D.; the root filling was chlorapercha and guttapercha. In A the cementum showed a streptococcus growth in 15 per cent., or 85 per cent. efficiency; in B, the dentin showed streptococcus growth; C, root filling, 40 per cent. growth, 60 per cent. efficiency; D, root filling in middle third, 60 per cent. growth and 40 per cent. efficiency;

E, root filling, gingival third, 80 per cent. growth, 20 per cent. efficiency. That is not very good.

We then ran a series in which we used 20 teeth, and we have the different structures, the gingival third, middle third, apical third, dentin near apex and cementum near apex. These teeth did not have the crown protected with paraffin or any other material, and out of the 20 teeth only four equalled one hundred per cent. efficiency or a net efficiency of 20 per cent. Now, I wish to show you something interesting. You remember the root filling is acting as a cork. In this case the culture could enter from the crown as well as from the apex, and we have the cultures more profuse where the root canal was the largest. In other words, the guttapercha root filling, when it was thoroughly sealed, did not close out the bacteria from the root canal. Our efficiency, as you note, is an average of 20 per cent. That is very low. Chlorapercha was used in all but two in which paraffin was used, and resin and chloroform, which was used in five. The paraffin showed 40 and 20 per cent., the chlorapercha showed 20, 40, 80, 60 and 62, and resin and chloroform showed 40, 20, 20 and 40.

We then took thymocresol and made a series of tests. We found the efficiency in one series zero and in another zero, 50, 20, 20 and 70 per cent. No tooth was free from infection in some part of the tooth, so our net efficiency was zero. These operations were made as carefully as we could in the laboratory.

We then took 17 sterile teeth and took as root filling material chlorapercha and guttapercha. The infection actually went in through the apex of it; it couldn't go in any place else because the entire tooth was covered with paraffin.

Somebody recently said to me, there was a time I could go to my office in the morning and sing all day and when I shut my door at five o'clock in the evening I left all my office cares there and went off as free and light as a bird, but you fellows have taken all the joy out of dentistry. If ignorance is bliss, why, we may have taken some of the joy out of dentistry, but, gentlemen, these are times in which we have something else to do than to be happy and simply exist. It is a great responsibility to live to-day. The man who is going to live and take a place in the world and use up the bread and butter that is so scarce these days must do something worth while for humanity, or else he had better go and ask somebody to bury him.

This question of root filling is an exceedingly complicated one. We are undertaking in the studies we are making at the Institute now to determine not only where the infections exist in the teeth, but determine how we may perfect root filling methods and materials so that we may seal the bacteria out of the tooth structures after we have succeeded in sterilizing, assuming we succeed in that, for I believe we will.

ROOT FILLINGS IN EXTRACTED TEETH BY SELECTED DENTISTS.

Dr. Price then made reference to a series of teeth which had been sent out to be root-filled by a group of selected dentists in different sections of the country, and in referring to the results, said, if that is the average, gentlemen, of the dental profession, we might as well take our hats off to nature and say she has been very tolerant and kind, and we have assumed a whole lot of the credit due to nature, for we did not do what we thought we were doing. If these facts are facts that are borne out in our profession, I myself believe I have never done as good work as the average of these dentists who tried in this experiment to make a root filling as nearly perfect as possible and had every opportunity to do so. In other words, I believe it is almost a physical impossibility, with the materials we have now, to fill a root canal so perfectly that bacteria can't get into it in some way or other some time. What does it mean? Let us try to keep the teeth alive; and the man who, in the light of to-day's information, will deliberately take the pulp from a tooth for the sake of putting on a bridge in a stronger way than he could put it on by leaving the pulp alive, has, to my mind, not fully realized the responsibility that is upon him, to so fill that tooth from which he has removed the pulp that no bacteria can ever enter. It is not a problem, gentlemen, of shutting bacteria out at the time we root-fill; it is a problem of keeping the environment about the apex so nearly normal, that there will be no change in that tissue which will ultimately make it a culture medium for bacteria. I would infinitely rather have you take bacteria from my mouth and inject them into the healthy alveolar bone or gingival tissue, than to put acid through the root apex of that tooth and destroy the tissue, so that it later would become pabulum or culture medium for bacteria. Organisms will find their way through the body and find a culture medium no matter where you hide it, some time; and you do not have as your problem simply keeping bacteria away from the apex of the tooth, but your problem is to keep culture medium away from the end of that tooth.

UNCERTAIN RESULTS IN USE OF GUTTA PERCHA.

With reference to the results of our studies of root filling materials, particularly guttapercha, let me tell you in a word what they were. Guttapercha as it comes to us in cones or blocks, is a great deal like a piece of wax that has been rolled, or rubber that has been stretched and frozen. All you need to do to demonstrate that, is to take a slab of base plate guttapercha and make a drawing around it on a piece of paper as you take it from the box; throw it in hot water for a few minutes, then take it out and lay it on the same area and see how it has changed shape; instead of being five inches long and two and a half inches wide it will have shortened to say four inches long and three inches wide. Why? It has an elasticity in the

state in which it was rolled, it was congealed and held in that position and you have that elastic content locked, and immediately you apply heat it creeps. That can happen to a degree when you put guttapercha into a root canal, and undertake with a warm instrument to make the guttapercha plastic, so that it will flow. That is not our greatest problem, for we do not use heat particularly to make guttapercha flow, we use a solvent like chloroform. When guttapercha is dissolved in chloroform and allowed to re-congeal to the point at which it is just dense enough so that you can make a dent in it with an instrument, it will have about the density that it would have when you can work it in the canal of the tooth. Probably most of us will use more pressure after it is sealed hard, and the chloroform has evaporated, than in that state I have just explained. Before I tell you the ratio of the dimension with that much chloroform in, namely, the amount that will make it possible to make it flow after all the chloroform is gone, I am going to ask you to do a little guessing. What is your impression as to the relative volume of the guttapercha, when it has only enough chloroform in it to make it flow? As 260 is to 100 (2 6-10ths, in other words), that is when all the chloroform has gone out. Those are not my figures alone; they are made by a splendid physicist, Professor Daton C. Miller. When we use a solvent with our guttapercha to make it flow, we have a mixture that occupies more space than the root filling will have, when all the chloroform is gone out. We may take that up by adding enough more guttapercha to take up that chloroform, and a number of other expedients, suction, pressure, etc., but I know of no way whereby guttapercha can be manipulated in the root of a tooth so that there will not be considerable contraction, which largely accounts for the errors which are shown in the results I have given you to-night.

DISTRIBUTION AND KIND OF BACTERIA PRESENT.

Now, we will study the distribution and kind of bacteria that are present, and I show you a number of teeth, using the Alport system to indicate the point in the tooth from which the culture was taken, the organism found, and in the roentgenograms you see the amount of destruction shown in that tissue. We have, first, a patient with acute rheumatism, next a patient with chronic rheumatism, and third, a patient with heart infection. In all these cases we have gotten a mixed culture, but when we inject into animals the organism that has grown-out, is and always has been a streptococcus, and rarely have we found anything else growing in the tissues of the animal except streptococcus.

If I had time to go into a discussion of the physical characteristics, or I might say, the distinguishing characteristics, of different lesions, and focal infections of the mouth, I would emphasize as the most important, that the tooth that is likely to be producing and contribut-

ing to acute rheumatism, chronic rheumatism, heart irritation or neuritis is likely to be a tooth without a fistula. I will express that in another way. That in a large number of tooth cultures from a number of patients, less than five per cent. of the teeth had fistula in those very extensive periapical infections, where the patients had those lesions that I have named. Again, the teeth that are most likely to be producing neuritis and acute rheumatism, may have not only a very little lessened density of bone, but may have an increased density of the bone a condensing osteitis.

I am particularly glad to have Dr. Harold Box here to criticize this, because I consider him one of our very best tissue pathologists. It is a significant fact that in 30 patients we treated at the Institute this last year, under exacting conditions, which had an acute rheumatism or chronic rheumatism, and particularly neuritis, that seemed to be related to dental infection, in a large number of instances we had to cut the bone away from around the teeth before we could extract them? You have seen it in your practice if you have been watching for it. It seems to be true that there is a change taking place in the supporting tissues of the tooth caused by the presence of the organism and which is not one of rarefying osteitis which so many are looking for as the means by which we will make a diagnosis. Personally I have come to be as much or more concerned for the teeth with an increased density as those with a marked rarefaction, particularly when the patient is showing a marked chronic manifestation.

HEREDITARY INFLUENCES.

I want you to consider now some information from an entirely different angle, for we are going to study the other side of this equation. We have been studying the tooth and its organisms. We want now to study the patient and her resistance. Insurance companies are always looking for new methods by which they can determine a man's danger of infection, and they have brought this remarkable information that the patients that have neuralgia, headache and nervousness, colds, abscesses and skin troubles are found in these percentages, 31, 19, 22, when the patients are without devital pulps from crowned teeth. You notice those percentages are small. They have found in patients with devital teeth that the percentage has increased: 10, 50, 117, 15, 68, 53. But when this lesion has gone to the extent, in patients with devital teeth, of blind abscesses and definite areas of rarefaction you must increase the percentage to 18, 64 and 164 per cent. When the heads of the Metropolitan Life Insurance Company had that information furnished to them by Dr. Hyatt, the head of the Dental Department, they said that is one of the most important contributions that has come to us in a long, long time; and when the statistician found it he said, a matter of three or four per cent. we consider a big thing, and 10 or 20 per cent.

is very significant, but when you bring us figures up to 164 per cent. it is overwhelming, it means it is something we have got to give attention to, and our whole Department must adapt itself to it. The result is that that splendid Institution is suddenly diverting its activities right there to see what further information they can get. This comes from an external source entirely, the statistics of men who are in the life insurance business.

Now, another group of men have been at work and they are the men who have been getting statistics to see what part heredity plays in the development of disease, and they have been concerned, particularly with mental conditions, with idiocy, and the Mongolian type and the various lesions that would be expressed in the tendency to criminality, etc. They bring us the information incidentally often brought out in their charts, that heart disease seems to be inherited in some way. They have not been trained at all as physiologists or pathologists, they are simply statisticians; they have unearthed that important information, and I want you as a jury to sit in judgment on that evidence and see whether it is worth anything. They were not prejudiced; they were not looking for the information, it simply came out incidentally in connection with their other work.

The next is a study of chorea patients and the results obtained in studying nervous troubles. They have not even probably thought of the pathology underlying it, they are simply stating a fact to you. Then we have digestive troubles that seem to have been inherited. A man had a lesion, his son had a lesion, his daughter did not, but she married a man who had a lesion, and two of their offspring had the lesion.

When a trait is inherited by an individual something material has been transmitted, and if you will think of the germ cell as a train of cars and express cars, if you please, and each car loaded with packages about as big as your hand, and every one of those express cars filled right up to the roof, you will have an idea of the number of determiners that are carried over in each of the male and female sex cells. If now you will take that train and divide it from one end to the other through the middle, take half of every package and put it in one lot and take half of the other package and put it in another lot, and then split another train right through the middle and take half of each of the packages contained in that train and put it with the opened half package of one of this other train, and finally make up a new train, half of each train made from half of the original train, you will see what has taken place when the two germ cells get together. Each one of those packages we will call a determiner of a character. Now, have this in mind for a moment, there are three great fundamental principles of heredity and only three. You can get it all in these three great laws of heredity. I don't think you will find it difficult to grasp. First, that the characters or characteristics

of the human body, whether the color of the eye or skin or resistance to disease—*characters are inherited as units*. That means that the color of the hair will be inherited independent of the length of the nose or the height of the stature. Each character is a unit and independent of every other unit. Second, *characters are not inherited at all but the determiners for those characters are inherited*. My boy does not have my nose, because I still have my nose, but my boy has a nose like mine; he has the determiner for a nose like mine. The character was determined by the determiner that gave size and shape to the nose. And, third, and this is the hardest one of all, that *my boy does not inherit anything from me that I did not inherit from my ancestry*; that my boy and I are half brothers by different mothers. That is a hard thing to accept, but it is just as true as that we are sitting here. I cannot transmit anything to my boy that is not transmitted to me. I can at best pass on to him a series of determiners just as good as I got them if I am very careful of them. I may probably, and that represents the progress of the race, be able to improve them an infinitesimally small amount by giving them an ideal environment and my boy is a half brother of mine for he has received a determiner for a nose like that from the same origin I got that determiner and that my father got that determiner; and those determiners are transmitted down through from one generation to the other, and are resident in the sex cells only of both sexes, and have nothing to do with the hands, arms, feet and brain, and the rest of the body. They can be destroyed in an instant, certainly in a few minutes, by certain chemicals, particularly alcohol, lead and arsenic.

Dr. Price then gave further illustrations bearing upon the question of the determination of characters or characteristics through or by means of the sex cells.

HEREDITARY INFLUENCES APPLIED TO PRACTICE OF DENTISTRY.

Now we come to another phase of it which is the reason for the previous discussion, and I want you to take this with a great deal of care and be very critical. So far as I know it is a new interpretation, is not worthy of being classed as a demonstrated fact. It is suggested to you for study and I want you to be on guard and not allow yourself to be influenced by anything I may say, for it may not be based on facts. When I presented this in one of our leading educational centres recently to a mixed dental and medical audience in which some of the greatest pathologists of this continent were present, one of them said in discussion, "All I can say is, it is delightful but doubtful"; and another in discussing it said, "To me, in the light of our teaching, it is heretical." I have had the satisfaction of having one of those men state to me since in a letter that some of the evidence I presented seemed to be borne out by further observations. I want to say to you as we have gone on with these studies they are getting more and

more delightful and less and less doubtful, which is an encouraging feature.

The thing I want you to think of is this, that you and I have inherited a resistance to disease that may determine whether or not it is safe for an infected tooth to be left in our body; and it is more a problem of our resistance than it is a problem of the infection of a tooth; that focal infection in the mouth is rarely, if ever, the primary lesion in the case of rheumatism and neuritis, though it is often the secondary one. You and I have a definite resistance to typhoid depending upon whether or not we have had typhoid. If we have had typhoid we are not likely to have it again. The very fact that we have had typhoid is our protection against typhoid, Why? Because by having it we have built up a chemistry that combats that disease. Some of us will not have tuberculosis because we have a normal resistance to that organism. We probably have inherited a high resistance to it. The question as to whether or not we will have tuberculosis is one of our resistance and the largeness of the dose that we must get to break our resistance will depend upon not only our inherited and acquired resistance, but also upon the amount of depression that is put upon our body to destroy our normal resistance to that disease. Again, our resistance is in proportion to our age pretty much, and as we get older we will have less and less resistance, and the time will come when probably the majority of the men in this room will die as the result of a type of infection that is in their mouth or body at this very time, and the time at which it will come depends upon when that organism is present in the body in large enough quantity to overwhelm the body or when the body has its total resistance lowered to a sufficient point. One of the greatest pathologists of this country has made the statement that 90 per cent. of the people living to-day in our civilized communities will die as the result of an infection of the streptococcus variety. That the streptococcus will strike the final blow. The other ten per cent. that do not die of that will be people that will be killed by accident. What does that mean? A man gets pneumonia and the thing that strikes the final blow in pneumonia is very often, if not generally, a streptococcus infection that gets into the circulation, and the pneumonia lowers his resistance down so low that finally the streptococcus which is growing in his body gets into the blood stream and suddenly his resistance is so low that it can develop there. A large number, as you know, of the so-called diseases of to-day are not diseases at all, they are simply symptoms of disease. The disease is the lowered resistance to systemic infection, and the thing that we have called cholecystitis or nephritis is simply a symptom of this general condition. How many men in this room had growing pains when you were a little boy? The men that have not had it don't know what you are talking about. Will you men who have had growing pains tell me whether you have had trouble with your tonsils?

The thing I want to bring to your attention is that there are certain susceptibilities that are liable to relate themselves together. You men who had growing pains when you were children, if you had the real thing, had inflammatory rheumatism. You have in other words inherited very probably a susceptibility to rheumatic infections. Did any of your family have rheumatism?

DR. WALDRON: My father had it before he died.

DR. PRICE: I am very glad he didn't have it after. Do you see what I am getting at. Determiners are handed down from one generation to another that furnish the resistance to the streptococcus infection and to pneumonia, typhoid and tuberculosis, just as there is a determiner to the length of the nose and the color of the hair. Do you see the point? There are a whole lot of people that will have an unequal fight in life if they have a large amount of infection in their mouth; and I think I can show you people that can stand a thousand times as much infection as some others can stand, because they have so high a normal resistance to streptococcus infections. When a little child is born the alimentary tract is free from bacterial growth. Within twelve hours the streptococcus appears and that organism is never absent from the human body and from the alimentary canal from that time until death, and it lives as one of the complements of life in the body that has a high resistance; but in a body with low resistance, if it can grow in a culture medium that is suitable to make it develop its affinities for tissues, it will take on a quality that will make it attack certain tissues or liable to attack certain tissues of that body. The primary lesion is the human body's lesion in that it has the lowered resistance and when you men take a roentgenogram to any of your fellow practitioners and ask him to read it and you say, tell me what I should do for that patient? Remember he ought to study that patient for an hour or two hours before he can answer your question. The information is not in the roentgenogram in the first place, for 25 per cent. of the teeth we found seriously contributing to infection in our work in the institution did not show the lesion in the roentgenogram.

The method I suggest for approaching this subject is by a study of the question of inheritance susceptibility (as shown by chart). If there is any false philosophy or false pathology or false biology included in this I want to know about it.

Dr. Price then gave a number of slides illustrative of various groups of infection, together with charts taken from practice showing the influence of acquired and hereditary susceptibility and immunity.

In reference to rheumatic affections Dr. Price stated that while he might be entirely mistaken in it, it seemed to be true that patients who have susceptibility to true rheumatism do not have susceptibility to true neuritis; that very rarely were they both found in the same patient.

In conclusion Dr. Price stated that what he had shown would be

sufficient to convey the thought, namely, that the resistance of the tissues is the primary and most important factor, and that resistance is a quality that is determined partly by inheritance and partly by environment, and that we can acquire a susceptibility and we can inherit a susceptibility.

In reply to an enquiry from Dr. Webster whether we are justified in denominating a lowered resistance as a lesion, Dr. Price said, justification for that is not based necessarily on the definition, as we ordinarily understand it, of lesion, but on a liberal construction which would make us see resistance as a normal part of the mechanism by which the body fights disease, and any interruption or any factor that is taken out of that mechanism I would say was a lesion. There is a factor lacking in the body that has a lowered resistance, and that element that is lacking I am speaking of as a lesion—a lesion in the mechanism. I may not be justified, but that is the way I consider it.

STERILIZATION OF CUTTING INSTRUMENTS.—Knives can be safely sterilized by chemical and mechanical means without the use of heat in any form. Immersion in 95 per cent. alcohol has the *least*, and boiling the *most*, effect in dulling the edge of a knife.

FINISHING OCCLUSAL SURFACES.—To polish deep grooves in inlays, cast crowns, or dummies, employ dull fissure or round burrs in the engine, after which a beautiful finish may be secured by polishing with a small brush wheel, charged with polishing material.—N. R. Smeltzer, Dental Review.

USE OF TOOTHPICKS.—There has been a good deal said about toothpicks, pro and con, one person advocating a quill and condemning a wooden toothpick, and his next door neighbor holding just the opposite view. If food has jammed between the teeth, I would advocate the quickest means of getting it out, whether with silk floss or toothpicks, using care not to injure the gums, for it is commonly believed that a great deal of infection takes place through these little abraded surfaces. In fact I think rubbing the tooth surface and gently massaging the gums with a wooden pick is productive of good results, for it stimulates the circulation and breaks up and removes microbic plaques and other debris. The pernicious habit of systematically jamming a toothpick into interproximal spaces, crowding the gum tissue down and then giving the pick a twist, thereby lacerating and cutting the gums, should always be watched for and stopped, for the little pockets formed by the recession of the gums from this cause are places where debris lodges, and they make an ideal incubator for growing bacteria, thus infecting the gums and producing inflammation, which causes serumal deposits to gather and pyorrhea will follow.—F. H. Skinner, Dental Summary.

The Effect of Time and Wear on the Human Teeth*

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ENAMEL—COLOR.

THE color of the enamel of the human teeth gradually darkens with years, but to a much less extent than is commonly supposed.

It is the dentin which gives the general color to the teeth. The enamel, however, is subject to the influence of staining substances applied locally. In many parts of the world teeth are stained black or brown with vegetable stains. The betel nut is most commonly used for this purpose. Tobacco gives the enamel a distinct yellow hue. Enamel which readily becomes stained likely has some physical defect. Occasionally, enamel, which was perfect before a long serious illness, becomes mottled yellow and white. A few cases have been seen in which the whole surfaces of the teeth are chalk white or dead white like paper. Such enamel may readily take up stains and can be almost as readily destained. Old teeth, whose surfaces are much worn, stain more than those not worn.

Histologists have said that the enamel rods, as they approach the dentin, are more interlaced than at the surface, but this would not seem to be the case, judging from practical experience because enamels, whose surfaces are worn away, split more readily than the reduced thickness would seem to indicate. It is the loss of the cementing substance of the enamel which makes the chief changes in the color and in the friability. If the cementing substance is lost the teeth are a dead white, but may soon become stained from acids formed in the mouth or from vegetable stains. One often sees deciduous teeth much stained, especially if they have been considerably worn or too long retained.

Stained enamel may be destained by applications of hydrogen peroxide under heat as described by (Head). A pledget of cotton is saturated with peroxide of hydrogen and placed upon the surface of the enamel and a large hot instrument is placed upon it. This is repeated several times. Unfortunately destained teeth soon return to their former color because the enamel is defective or porous and the cause of the original staining is likely still present.

There is a type of pink tooth which occasionally occurs in one or more of the anterior teeth that must not be confounded with the pink tooth following the devitalization of a pulp, or the pink hue due to a staining of the enamel. The pink tooth mentioned seems to have the color in the dentin.

The wise dentist will base his treatment of discolored enamels upon the cause and the prognosis, knowing that as years go on pigmentations increase. There are green stains on the surface of the anterior

* Read before The Toronto Dental Society, February 25th, 1918.

teeth of young people and reddish pigmentations on the surface at the gingival, found in some localities which are not to be considered at this time.

WEAR.

As years pass, the enamel becomes gradually thinner and thinner, depending upon the amount of grit or friction applied to the surface. Among these races of people who use sand on wood fibre sticks to polish their teeth, the enamel is frequently worn completely through. This also occurs among people who live in sandy desert places or among those who eat foods of a sandy character. Chewing tobacco will do it. As the enamel becomes thinner it becomes more friable, having checks or cracks almost the full length of the crown. These checks are often open wide enough to admit staining substances, thus giving a yellow streaked appearance to the labial enamel. Dentists of experience have often been struck by the ease with which enamel will check when sharp instruments accidentally cut across its surface. Corners of incisors seem to split off without much apparent reason. Such enamel needs special attention in cavity preparation; namely, lap joint inlays. If the pulp is lost there is no doubt about the enamel becoming more and more friable as years pass. Such enamel is less strong and should receive different treatment in cavity preparation from the enamel of vital teeth.

Besides the wear from abrasion there is the wear of attrition and erosion. Some enamels and dentines, especially of the deciduous teeth, wear away until the half of the substance of the teeth is lost. A peculiar thing about some of this wear is the cupping of the occlusal surface. It would seem that as soon as the enamel is worn through, the dentin hollows out, though it does not come in contact with an antagonizing tooth. An erosion rather than an attrition or abrasion. These cuppings are often so deep that fruit seeds and other foods wedge into them splitting the surrounding enamel. Judicious grinding of the enamel, in such cases, will avoid large plates of enamel being split off. It is not at all uncommon to see the teeth of old people worn to the gum line, especially is this the case in the anterior part of the mouth, if the molars have been lost.

The effect of occlusal wear, if in marked degree, is to bring the upper and lower jaws closer together with the consequent change in the condyle path. With the closure of the jaws there is a protrusion of the lower. If the molars and bicuspid have been lost, an edge to edge bite is developed which usually brings about a rapid wear with less cupping. In some cases the upper anterior teeth are protruded and worn chiefly on the lingual aspects. Teeth which once antagonized normally will sometimes develop a gliding wear which will place them in false positions, while in other cases, the wear will be such as to lock the bite, giving the patient no possibility of lateral movement while the teeth are in apposition. Single teeth often

begin to change position without any apparent periclasia, such cases often have their origin in occlusal wear. Such mal-occlusions as are developed from occlusal wear might be classified as traumatic occlusions and undoubtedly have a baneful influence on the peridental membrane. Having recognized the condition and its prognosis if untreated, the dentists' duty is clear. Restore the teeth and occlusion to the normal for this patient, keeping in mind that which is normal for one patient is not normal for all others. Don't be afraid to use carbon paper and the stone but leave all ground surfaces highly polished.

It would seem that the more rapid the occlusal wear, the more likelihood of the surfaces being sensitive to attrition. If acid fruits are indulged in, such exposed dentines become exceedingly sensitive. In cases of eboration, however, no such sensitiveness develops from the use of acid fruits or become sensitive to thermal changes. Pathological pulps are undoubtedly developed under worn teeth as hyperaemic pulps, pulp stones, atrophic pulps and marked pulp recession are more likely to be met with than in unworn teeth. If for no other reason than to save the development of pathological pulps, exposed dentin should be protected from irritation. One's observation should have told us that the tooth tissues are exceedingly porous, but it remained for Bunting to demonstrate it. In future exposed dentines will get more attention than in the past.

Erosions, which are commonly supposed to be found on the labial, buccal, and occasionally, the lingual surfaces are in the writer's opinion not at all different from the loss of tissue which occurs on the occlusal surface. There is undoubtedly a combination of solution and attrition or abrasion. The tooth tissue is softened by a weak acid and then the tooth brush or food readily wears away the surface. All the peculiar notchings of the labial and buccal surfaces can be readily reproduced by artificial brushings. Once the enamel is worn through the dentin goes rapidly.

Dental toilet preparations, such as pastes and powders, depend upon a grit which they contain for their value. Some of these preparations contain so much grit that if used once or twice a day over a period of many years, the enamel will be worn through and deep cuts made into the dentin. Those preparations which have a finely ground powder are not as efficient for cleaning the surfaces of the enamel and may be used much more frequently. It is essential that a dentist, in recommending any tooth preparation should also know how frequently it should be used.

In many cases of considerable occlusal wear in the molar and bicuspid region, contact is lost and the patient is unable to masticate satisfactorily, although he may have a full complement of teeth.

The writer has observed that teeth which wear away badly rarely have dental caries and what is more, such dentines cut easily as if

they were less dense. If for some reason, solution ceases, then there develops a hard glistening surface as if brought about by burnishing. This surface is often as hard as some enamels. It is called abornation or tubular calcification.

The linguo-occlusal surfaces of incisors wear away until the dentin is exposed, leaving the thin labial plate of enamel unsupported by dentin which readily splits off leaving a saw edge to the enamel or in some cases so much splits off as to leave distinct notches. Such wearing and notching is more rapid if the molar teeth have been lost.

When teeth have been lost or there is a marked malocclusion there is often a gliding wear which cuts deeply into the tooth structure, causing the recession of the pulp, or its death, as well as peridental irritation.

Dentists of experience and observation have recognized that natural tooth tissue wears away more rapidly than fillings, inlays, crowns, bridges or artificial teeth, but how many have applied this knowledge so as to prevent the failure of former dental operations. As the teeth wear down, fillings, inlays, crowns and bridges receive more and more of the weight of occlusion. All have recognized, with pride, the glistening burnished spot on the lingual surface of an anterior filling or inlay, showing the heavy occlusion delivered upon this surface. Proud of our former skill because the filling has not been dislodged, though it receives unusual stress. The consequence of such impact, is certain to dislodge the filling and, perhaps, the corner of the tooth as well. If it should happen to be a crown, it is sure to bend the pin or split the root. Such points of weight of occlusion should be freed by grinding, from time to time, as necessity demands. This is a prophylactic measure. How we have watched that large pure gold inlay or amalgam filling being beaten by an antagonizing molar tooth as if it were intended to make gold foil of it. Sooner or later such fillings will fail. An amalgam so beaten will flow, if the filling doesn't fail, the peridental membrane will.

Another consequence of occlusal and proximal wear is the development of periclasia from wedging of food and traumatic occlusion. Since the introduction of the inlay process, there is no reason for not protecting against occlusal wear and proximal wear as well.

There is an approximate wear of the teeth which is little recognized and is always associated with marked occlusal wear. The individual movement of the teeth is sufficient to wear distinct facets on the proximal surfaces thus leaving flat contacts where there were once convex contacts. This reduces the mesio-distal diameter of the teeth and permits food to pass between them and make the beginning of periclasia.

The wear of artificial appliances in the mouth will not be considered in this connection.

Time undoubtedly brings about a certain chemical change in both the enamel and the dentin as occurs in other hard structures of the

body. This chemical change has its chief effect on the cementing substance of the enamel rods. There is a reduction of those vital elements which hold the rods together and an apparent increase of the calcium carbonate elements. Though enamels may be more resistant to cutting instruments they split easier as years go on. So it is with dentin, there is an increase of the calcium salts under normal conditions and yet there would seem to be a distinct decrease in these elements under pathological influences. Every operator has recognized that tooth tissue gradually becomes less sensitive to cutting instruments as years go by, and that pathological dentin or the pulp of the old patient may be more sensitive than that of the young.

These chemical changes in the structure of the teeth must not be looked upon as being sufficient to make the tooth of the old person less liable to dental caries than the young. The cause is much more obscure than this.

Having directed our attention in a very cursory manner to what occurs in time and wear of human teeth, let us now think of the effects of those changes. How should the knowledge of these things influence our practice? It is all very well for us to examine a young patient's mouth and recognize several small gold fillings in the proximal surfaces of the anterior teeth, and also a slight linguo-occlusal wear, but how many of us really begin to figure out what this means for the patient twenty-five or forty years hence? It is one thing to discover what is now happening but unless we are fully aware of the remote consequence of the present conditions, we are not likely to apply appropriate prophylactic measures.

The time was when dentists were most anxious to find a remedy for the symptoms presented by their patients while to-day many are keenly exercised about the cause of the symptoms or the diagnosis. This is good as far as it goes, but let us now look into the future a little further and study the remote consequence of a wearing down molar or a decay at the gingival of a second molar, at sixteen years of age. How unconcerned we are when a child of ten or twelve presents with a beginning caries in the upper lateral incisor. Let me remind you older practitioners lest you have forgotten, and sound a warning to the younger men, of the dental history of such a lateral incisor. A cement filling for two years. A silicate for perhaps three more, or perhaps a small gold filling for the same time, or perhaps five years more. Each succeeding filling getting larger and larger until the occlusion strikes heavily upon the lingual surface, as the teeth wear away. The filling receives the occlusion and is dislodged together with the corner of the tooth. Now a step cavity with either a gold filling or an inlay, this lasts well, until, perhaps, the molars and bicuspid are lost or the teeth wear away until occlusion again dislodges the filling or a few months' neglect has caused the involvement of the pulp. The pulp is devitalized, the root is filled, another

inlay or crown is placed. In a few years more the patient develops rheumatism, endocarditis, Chronic Brights or gastric ulcer. If the root is comfortable, it may not be suspected. An accidental heavy pressure splits it, when no further mechanical arts can do anything for it except extract it. The extraction relieves the patient of her chronic systemic disease. A marvelous cure made by Dr. Brown or somebody's pink pills for pale people. The patient blames the dentist for splitting the root when the crown was being set, and the dentist blames the patient for cracking nuts with her teeth; none of them recognizing that the splitting of the root was a godsend and that the original caries was the serious misfortune. This is but a short history of a small cavity in the lateral incisor.

Who among us thinks over the future dental history of each tooth, as well as the teeth of our patients, as we serve them from time to time? Until we can predict the dental future of our patients we will be unable to guide them through a long life with the best possible results. So long as we continue to treat the needs of our patients from day to day, so long should we be classed as tinkers having no thought for the morrow.

If we are now convinced of the importance of looking into the future dental history of our patients, what are the effects of the wear of the teeth upon the occlusion, the facial contour, the pulp, our former dental operations and the peridental membrane, on the soft tissues and what prophylactic remedies may be instituted to, as far as possible, minimize any baneful consequences?

Before a body of this kind, it is not necessary to do more than point out the necessity and direct the way and the rest will follow. Preventive measures based upon a knowledge of the structures involved, the forces at work and the history of many cases gone before, will do much for the dental future of our patients' comfort and health, as well as great good to the profession.

If someone would write the dental history of several patients it would awaken in the minds of the profession a realization of the shortcomings of their calling which would forever do away with such expressions as permanent denture, permanent fillings, guaranteed crowns, fillings, etc.

DISCUSSION OF DR. WEBSTER'S PAPER.

DR. R. D. THORNTON: I do not feel that it is necessary to go through the formality of complimenting the essayist on his excellent paper. The quality of the essay this evening, however, is ample evidence that it is not necessary to go beyond our own city limits for material for this society. Furthermore, I should like to remark that those members of the Society who have been unable to be with us this evening have missed a real treat.

Dr. Webster's address this evening comes to us at a most opportune time. We have heard a great deal lately about Root Canal, Radiography, Prosthesis and Dietetics in relation to Preventive Dentistry. There is great danger of carrying these ideas to extremes. It seems to be a weakness of human nature. When we attempt to specialize we tend to narrow our horizon. This has been carried so far that the public do not know just where they are at, and as a result, public opinion, sooner or later, demands an investigation. This has been clearly shown recently in this province, in the investigation of the different branches of the "healing art." The result is that it has been recommended that certain branches of the healing art be thrown out, body and bones. The fact of the matter seems to be that each branch has some justification for its existence and all that is necessary is a modification of our system, so that the good points in each might be utilized.

I believe the essayist to-night has helped to broaden our views, and yet he has taught one point only; namely, preventive treatment. He has emphasized one idea all through his paper, that is, the relationship our service at present will bear to the patient's future welfare. Incidentally, permit me to interject that, if the Toronto Dental Society can place, before its members, just one good idea at each meeting, it would fully justify its existence. While our chief aim is preventive dentistry, I presume we will all have to practice restorative dentistry until that Utopian era arrives when everything will be ideal. Restorative dentistry is intended to accomplish three things; namely,

First: Check the existing pathological conditions;

Second: Restore as nearly as possible normal conditions;

Third: Prevent further pathological conditions.

Theoretically this seems simple enough. In the matter of the teeth Nature has produced for us an excellent model, devised to be efficient in its functions, self-cleansing, hygienic, beautiful in its arrangement, and calculated to last a lifetime under natural conditions. I do not refer to the type we so commonly see in every-day practice; distorted and changed by the artificial methods of living which our so-called advanced civilization seems to demand. I mean those almost ideal tooth forms which we occasionally see and which seem to have been more common among our ancestors of long ago.

I believe Nature has spent countless ages perfecting this type of denture to suit the environment, the habits and the diet of different species of animal life. And man is no exception to the general rule. Nature has rejected parts which are not of service to her in this struggle for existence and has specialized parts which best adapt their possessor to survive. Furthermore, she has transmitted these specialized parts to succeeding generations, so that I am convinced each part of the tooth has been developed for a particular purpose. The trouble is that we are not sufficiently familiar with the natural human dental

armament, and with the changes that take place in it, due to time and wear.

Only last Thursday evening I heard Dr. Webster make the statement, in regard to our methods of developing dental students, that "each tub must sit on its own bottom." If Dr. Webster "did not waste his fragrance on the desert air" so far as I was concerned, this adage meant that every student, whether graduate or undergraduate, must be developed to observe for himself the facts connected with the case under consideration, must arrive at his own conclusions upon those recognized facts, and act as his judgment dictates. If we carry this idea a little farther, it necessarily follows that each tub must have a bottom to sit on. Applying this to the dental profession it simply means that we cannot possibly be expected to detect and repair faulty or abnormal conditions unless we fully understand the normal. Let me illustrate this by a practical example:

A young woman whose history, as nearly as I could gather, was as follows: Age twenty-seven, unmarried, attended carefully to her teeth. About the age of twelve a large cavity had developed in the distal of the permanent upper first molar. Evidently the kind of restoration made for her had permitted food debris to force its way between this tooth and the second molar. The result was loss of contact, the second molar assuming quite a marked distal inclination. A little over a year ago the patient was obliged to have the first molar treated and a large mesio-occlusal cavity in the second molar filled. The dentist made an excellent attempt at building a contact point on the distal of the first molar and mesial of the second molar, but two things he seems to have overlooked. The first is the marginal ridge. From the middle third of the occlusal surface of each tooth down to the contact point was one long, smooth incline plane, forming an excellent "toboggan slide" for food matter with the result that the patient has practically ceased to use that side of her mouth for mastication because of the irritation produced by food being wedged in between those teeth. It matters very little how tightly those contact points may be made, if the marginal ridges are not also properly formed to prevent this condition. The force of mastication on surfaces of this nature will eventually produce a further separation and loss of contact. In the second place, a failure to observe the anatomy of the gingival third of these proximal surfaces, resulted in enough amalgam being forced into the soft tissues of the interproximal space, to make another fair sized filling. Furthermore the abnormal distal inclination of the second molar seems to have caused an impaction of the third molar. Its mate on the opposite side is in place but this one seems to be lodged against the distal surface of the second molar.

Dr. Webster made the statement, early in his paper, that it is the dentin which gives the general color to the teeth. This seems quite apparent. For example, on an incisor tooth, at the incisive edge

where there is no dentin, the color is a blue-white, but towards the gingival portion of the crown, where the enamel becomes thinner and the dentin thicker, the yellowish color of the dentin prevails. A little later the statement was made that if the cementing substance was lost, the teeth are a dead white. The question then arises, does the dentin or the cementing substance give, first, color to the teeth; and second, the translucent appearance which distinguishes natural teeth from artificial restoration?

The subject of dissolution of the cementing substance by the fluids of the mouth after the surface of the enamel has been worn away, and the staining of the teeth as a result, leads one to ask, what effect our modern methods of prophylaxis, as commonly practised, will have upon the highly polished enamel surface of newly erupted teeth? Dr. Webster's lantern slides seem to have illustrated this very well.

Another important feature of Dr. Webster's paper is the different treatment necessary in cavity preparation of pulpless and vital teeth. We have all seen those instances where large M. O. D. fillings have been inserted, leaving frail buccal and lingual enamel walls, with but little dentin supporting them. In vital pulps these might be safely left, but in pulpless teeth there is sufficient stress from the force of mastication upon these frail walls to frequently cause them to fracture deep gingivally. It is impossible to restore these so that they will be comfortable to the soft tissues. Many of these, I believe, are excellent beginnings for periclasia. A view to the future welfare of the patient would have meant greater extension of the cavity preparations and protection of these frail walls by metallic fillings.

With regard to the sliding bite I believe many of these could be prevented by careful attention at the time the cause arises. Loss of one tooth, for instance, a lower first molar or upper third molar, often gives rise to faulty occlusion with the result that the continual force of mastication will drive the whole upper side forward, resulting in a rotation of the lateral incisor or sometimes an overlapping of the centrals.

Dr. Webster has referred to the use of carbon paper and stone in adjusting faulty occlusion. Is it not possible that the use of the stone destroys the enamel surface and leads to destruction of the cementing substance of the enamel. In this way it may be as injurious to the patient, as the abnormal occlusion which was developing.

Referring to those cases of attrition where a great deal of the occlusal surface has been worn away, and the dentin exposed, these pulps may already be in a pathologic condition. Even if they are not, and we restore the grinding surfaces with an inlay, does it not seem possible that the irritation from the metallic filling will be just as great to that pulp, as the effect of the wear from attrition? Devitalization we know is undesirable, and yet pulps of low vitality remaining within the tooth may be just as injurious.

I do not know why Dr. Webster omitted the subject of artificial appliances this evening, unless he considered that a large enough subject for a whole evening's discussion. If that is the case we had better pass that over for the present.

It seems to me that in order to do our best for the future welfare of our patients we must see those patients frequently and regularly. This cannot be satisfactorily accomplished with a transient practice. I should like to have heard Dr. Webster speak of this along the lines of thought indicated in an editorial in the "Dominion Dental Journal" some three or four months ago, where he advocated the necessity for a family dentist. There is one objection to this method; namely, that a family dentist might fail to keep himself in harmony with the latest developments in his profession; consequently the patient would be the sufferer. This might be overcome to some extent, particularly in our larger centres, if we had many small clubs where eight or ten or twelve members could sit down to dinner around a common table and discuss informally, the difficulties which confront each other in daily practice.

In conclusion, if Dr. Capon will pardon a reference to his name, I should like to relate a little incident which occurred when I was a freshman at college. The Royal Dental Society had asked Dr. Capon to present a paper at their meeting. Another part of the entertainment was given by Mr. J. W. Bengough. I was too amateur as a dentist to appreciate much of the technical part of Dr. Capon's paper, but I could appreciate a joke. I remember Dr. Capon's closing remarks, that when he was a student, I think it was Dr. C. N. Johnson who used come quietly behind the students and look over their shoulder to see what kind of operation they were performing. Dr. Capon stated that, after graduating, he kept this one thought constantly in mind, that Dr. Johnson was always looking over his shoulder inspecting his work. At the close of the meeting Mr. Bengough drew a cartoon. It was quite evident from the first that the picture was going to be that of two men, but only the last few deft strokes that were given, revealed the likeness of Dr. Capon operating and the ghost of Dr. C. N. Johnson looking over his shoulder.

I believe it would be a great benefit to our patients if each member of this Society, when he examines a patient or performs any operation for them, would constantly keep in mind the thought that the shade of Dr. Webster was looking over his shoulder and asking him: "What effect is your service to-day going to have upon your patient's welfare at sixty or sixty-five years of age?"

DR. F. D. PRICE: The subject "The effect of time on the teeth," is a very timely, and, to me, a most interesting subject.

Those of us who have been in practice even a few years, have had ample observation of the effect of time on teeth. I had a lady in the office to-day, whose teeth I have cared for since she was a child. I was exceedingly sorry that she had to loose a tooth this week.

I feel that I should have been able to care for that tooth better so it should have been preserved.

Dr. Webster showed us slides illustrating the wear of teeth by different kinds of grits on tooth brushes. I think this was not sound analogy as the mechanical erosion took place in a few hours, when the teeth had not time to decay; whereas during a person's lifetime there would probably be considerable decay in the grooves and so, in actual life, the conditions would likely be worse than the illustrations.

Dr. Webster also spoke of grinding fillings that, because of being harder than the teeth, wear less than the teeth and in time occlude too forcibly. Is there not a greater harm resulting from cases of fillings being worn more than the teeth and so placing too little stress on fillings, and too much stress on the tooth tissue? This may be where the mouth presents plastic fillings over a large part of the morsal surface.

Dr. Webster seems to treat of the effect of time on live teeth. I wish he had also spoken of the effect of time on dead teeth. I can imagine that for some cause the pulp is removed and the root is filled as well as we know how. I want to ask, if there is not, in fifteen or twenty years, a deterioration in structure or a dissolution in the crown or root that may weaken it or leave it very easy of invasion by bacteria, and perhaps the whole tissue becomes septic. If that be so we can see what to expect the condition of any dead root to be after fifteen or more years. I cannot think of any other substance, largely organic, that might be placed in such an environment, favorable to decay, as the mouth presents, that would not decompose and become septic.

DR. J. W. ARMSTRONG: I think the attention of the profession should be called to a discoloration in the teeth that is sometimes produced by the pigment or coloring material used in the manufacture of some temporary filling materials that are on the market; such as pink gutta-percha and pink temporary cement. This is especially noticeable when sealing certain kinds of drugs and especially where the teeth have been devitalized, as the tubules absorb these pigments readily at such a time. Also mouth washes and all kinds of tooth cleansing agents should not be colored as their continued use is liable to cause discoloration of the teeth.

It is some years since I have ceased to advise the use of colored dentifrices.

DR. N. S. COYNE: How would you remedy uneven occlusal wear through two bridges (extending from cuspid to molar on the upper arch and a similar bridge on the lower arch) opposing each other, with metal cusps, on one side of the mouth, and the natural teeth on the other. Would a dentist be justified in removing one bridge, correcting the articulation, and setting a new bridge in position?

DR. WEBSTER: Yes.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

ROOT-CANAL TREATMENTS.

ONE of the best methods of checking up our progress in operative dentistry is to examine critically our technique of root-canal filling. A mass of information concerning this subject has been published in our dental journals, and it will be interesting to see to what extent we have benefitted by these papers. The improvements which we have brought about in our treatment of pulpless teeth may be fairly accepted as indicating the measure of our desire to serve the best interests of our patients.

Before taking up the more recent methods of root-canal treatment let us review briefly the records of the earlier attempts to do this work. For this purpose we shall quote from a paper read before the Indiana State Dental Society, 1917, by I. Lester Furnas, D.D.S., of Indianapolis, Ind. He says: "One of the earliest attempts at pulp canal filling was practised with the use of wooden points or splinters, and described as 'pulp knocking,' in 1853. The roof of the pulp chamber was first removed and with a quick blow from a mallet the wooden point or splinter was driven into the canal, painlessly of course! It would be useless for me to enlarge upon how utterly impossible it would be to properly fill root-canals by this procedure. Nevertheless it was a stepping stone. It was soon found that by baking these points to thoroughly dry them, before using, they would be much better because after their insertion the moisture would cause them to expand thereby better filling the canal. The next step was first to dry and then boil them in creasote, which you must admit was a step well taken in the right direction."

Perhaps few of us have seen cases of wooden points in root-canals, but we are all more or less familiar with methods which followed on after it, i.e., the use of cotton. In most cases the cotton was saturated with various medicaments calculated to maintain a healthy condition in the root-canals. This was thought at first to be an ideal filling material because little or no trouble was noticeable for some time after

the operation was completed. Time was necessary to show up its faults, and these proved to be so numerous as to cause a diligent search to be instituted for a better filling material. Consequently a host of new fillers were tried out. Among these were many metals such as gold, tin, lead, etc., in addition to materials such as silk, cements, hog bristles and amalgam. None of these proved successful and the search for an ideal filler continued. About 1865 gutta percha was first employed as a canal filling. Many failures with it were recorded due, no doubt, as Dr. Furnas suggests, to the scarcity of suitable instruments for working the canals and not to lack of care in technique as many are inclined to suppose. The introduction of reamers aided greatly in root-canal operations, and these, together with Dr. J. R. Callahan's suggestion for the use of sulphuric acid, seemed to have overcome all difficulties, because, by their use, a canal could be opened up thoroughly and prepared for the gutta-percha filling.

Following on after the introduction of gutta percha many pastes were placed upon the market, these being designed to take the place of all other materials for canal filling. They were said to be superior because they contained antiseptic drugs. It was soon found, however, that the pastes lost their potency as antiseptics and that canals filled with them readily absorbed fluids at the root apex. Dr. Furnas points out that for a period, approximately from 1895 to 1905, "there was little or no advancement made in pulp-canal work, more attention being given to anesthetics, analgesia and prosthetics. About the latter date Dr. Hunter, of London, England, advanced the idea that a large percentage of systemic infections have their origin in blind abscesses at the root ends of teeth, due to faulty pulp-canal fillings."

This brings us to the time of the introduction of the X-ray to detect the faulty root fillings—the present status of the subject. With its introduction the dental profession is face to face with the responsibility for many ailments, such as "arthritis, neuritis, endocarditis, many of the so-called rheumatisms, various circulatory and intestinal disturbances and many other body ailments that have remained a deep mystery to the medical profession through the ages past." How did the dental profession meet the new condition? To their credit it must be recorded that they shouldered the responsibility and at once devised new methods of practice in order to eliminate this grave menace to body health. Much has been accomplished in this new endeavor, and even greater victories will be won before the problem is completely mastered. A consideration of these new methods, however brief, would be too comprehensive for these columns, and we shall have to be content in simply reviewing their salient features. For this purpose we shall take the liberty of again quoting from Dr. Furnas' paper, because he has compiled in convenient form the names of those who have suggested improved methods of root-canal treatment, together with a resume of their method.

"Dr. John P. Buckley advocated the use of pheno-sulphuric acid and formo-cresol as therapeutic agents, then pumping into the dehydrated canal eucalypta-percha or chloro-percha as a canal lubricant, and then the packing of gutta-percha points tightly into the canals. This method has been used very successfully by many men, and can be classed as one of the best.

"Dr. John R. Callahan, of Cincinnati, after much scientific research, presented to the profession a technic, which when mastered, will produce results almost beyond criticism. It consists of opening and enlarging the pulp canals with the aid of sulphuric acid and broaches. The acid is then neutralized and the canals thoroughly dehydrated. The canals are then flooded with a six per cent. solution of resin in chloroform. The chloroform acting as a vehicle, penetrates the dentinal tubule carrying with it the resin in solution. The chloroform then evaporates, leaving the resin, which hermetically seals each and every dentinal tubuli. While the canal is still filled with an excess of the resinous solution, a gutta-percha point is selected as regards the proper size, and introduced into the canal. This point is then worked with a pumping motion until it is partially dissolved in the chloroform-resin solution. That portion of the point which is in solution will then be forced into the finest canals branching out at the root apex, and then, with the additional points, the canal is filled. This method is at present being used by many of the leading men of the profession with excellent results.

"Dr. R. Ottolengui, of New York City, has evolved a valuable technic for this work. It consists of carefully opening and enlarging the pulp canals, and filling with gutta-percha points, after having treated the canals with a lubricant such as eucalypta-percha. The gutta-percha points are firmly sealed in the canals by using a small mallet and canal plugger of the proper size."

Leaving for a moment the method of filling canals, let us get back to the question of how to open up and enlarge the canals previous to filling. Here it is that the X-ray may be made to play an important part. By its use we are enabled to ascertain when we have reached the apex. This is extremely important. The method of using the X-ray for this purpose may be well illustrated if we quote from an article by Percy A. Hill, D.D.S., published in the January issue of the "Commonwealth Dental Review." He says in part: "In my practice I usually, after the removal of the pulp at a previous sitting, insert a metal indicator to what I believe to be the apex and make a skiagraph. If the foramen is reached I immediately proceed to insert the root filling, after which I sometimes—though I do not consider this essential—take a second one showing the completed filling. If on the other hand I find my indicator has not reached the apex, it is a very simple mathematical problem to find the exact length of the canal to the fraction of a millimeter if necessary. Knowing

as I do, the length of the indicator inserted in the canal, the length of its shadow on the film and the length of the root shadow on the film. With this knowledge I am able to reach the foramen and insert my filling with exactness." Many operators hold to the opinion that it is always necessary to follow up root canal fillings by making repeated X-ray examinations some time after the operation has been completed.

To ensure the complete opening of canals and to remove all the material that is likely to prove injurious, many methods have been suggested, such as acid and soda, potassium and sodium (Schreir's), the use of broaches, files and like instruments. So much has been written of these methods that it is not necessary to review them here.

We have just given a brief statement of those methods which may be classed, perhaps, as the more advanced, involving as they do, not only an elaborate system of root canal preparation, but an equally extensive technic of root filling accompanied with frequent X-ray examinations. Let us now consider a method which, while being a little less elaborate, is proving satisfactory in practice. It is a method suggested by Dr. Furnas, "Open the pulp chamber until the pulp canals are easily accessible and then proceed to enlarge them to the best possible advantage with a fifty per cent. solution of sulphuric acid. Neutralize the acid and thoroughly dehydrate. Fill the canals with Callahan's resin solution and pump same to the root apex with a fine, smooth broach; then dry with hot air. This hermetically seals the dentinal tubuli. Eucalypta-percha compound is then used as a canal lubricant. This compound when cold should be very heavy and stiff, or in a molding stage and not a flowing stage. This compound should be heated to a temperature not less than 200 degrees Fahrenheit in a water bath, at which temperature it will be found to be very soft and flow very readily. The hot eucalypta-percha compound is then pumped into the canals, using for the purpose a very fine, smooth broach. As soon as the operator is satisfied that the canal is filled to the end with the solution, then a small cylinder of gutta-percha is introduced into the canal. The smooth broach is at once forced down along the side of this cylinder and room made for a second one, which is sent gently to its place alongside the first one. This is repeated until the small, smooth broach no longer can be forced into the canal to make room for additional cylinders. The canal then should be filled to approximately one to three millimeters of its mouth. A cylinder of larger dimensions is then inserted that will just about fill the mouth of the canal. This is pressed firmly into place with a large canal plugger and lastly given two or three light blows with a mallet. This will give you a canal filling that by no means is proof against failures nor is it above criticism, but the technic is easily mastered and can be put into thoroughly successful practice by any dentist. The time consumed by this method is but little, if any more, than that of other technics, and in my hands has been more successful."

PRO BONO PUBLICO

This Department is edited by **Fred J. Conboy, D.D.S.**, and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Save the Child

CHILD welfare is a potent problem confronting civilization today. The health of a child is greatly influenced by the condition of its teeth. Where, from decay or irregularity (crooked teeth), the child cannot properly masticate its food, faulty digestion and lack of growth of the body result. These conditions may be prevented by early treatment. The temporary or "baby teeth," if decayed should not be extracted but should be filled, as they are just as important as the permanent teeth in the development of the bones of the face. At the age of three years, the temporary teeth are all in position in the mouth, and from this time until the child reaches the age of six, there should be a gradual development of the bones of the face. This growth causes spaces to appear between the anterior teeth. To assist nature in this normal growth, the child should be given hard, coarse foods, and be taught to thoroughly masticate them. If, at five or six years of age, the natural spaces have not appeared between the temporary teeth, the larger permanent ones which begin to appear about this time, will not have sufficient space to erupt evenly, and will be crowded. Irregularities of the teeth and malformations of the jaws often become manifest before a child is six years of age. As the bones in which the roots of the teeth are implanted are less dense in young children, operative procedure for the correction of lack of development and malformation of the jaws should be undertaken and completed, if possible, before the permanent teeth appear. By spreading the temporary teeth early, the crowns of the permanent ones which are held by the roots of the temporary teeth are drawn into the positions which nature intended they should occupy. In this way irregularities may be prevented which would otherwise be inevitable and the benefits accruing from an entirely efficient masticating apparatus will be of great importance. Often parents are advised to wait until the permanent teeth have all come in before commencing treatment, thus increasing the deformity and making more difficult its correction. The earlier nature is assisted in establishing normal development, the greater will be the certainty of the teeth remaining in the positions in which they are placed. A temporary tooth should

not be removed to make room for any permanent one except that which is its successor. Where one or two teeth are out of line, because of lack of room, these should not be extracted, as their loss will break the harmony of the whole structure and later result in greater crowding. The correction cannot be commenced too soon. If other bones of a child's body are mal-formed, would you wait until the child becomes a man almost before making an effort to have the deformity corrected? Certainly not. Then why wait if the bones of its face are malformed? The dentist who will not make an effort to correct these conditions early, or refer you to one who will, is not doing his full duty. Irregularities of the teeth affect the health, appearance and prosperity of the individual, therefore if your child's teeth are crowded, consult your dentist, or if possible, an orthodontist NOW.

VERNON FISK, D.D.S.

Canadian Army Dental Corps, Draft

THE following men composed the 7th C.A.D.C. Draft for overseas. During their stay in Halifax, they visited the C.A.D.C. Surgery at Camp Hill, the ocean terminals, the district devastated by the explosion and other points of interest, the officers being the guests of the Halifax Club.

	Lieut. J. V. Ross	from M. D. No. 1
No. 809	Sgt. C. J. Harrison	" " " 1
	Capt. J. G. Somerville	" " " 2 (in charge of Draft)
	Lieut. H. L. McNally	" " " 2
	Lieut. W. S. H. Sinclair	" " " 2
	Lieut. H. W. Reid	" " " 2
	Lieut. S. M. James	" " " 2
	Capt. A. R. Hynes	" " " 2
No. 620	Sgt. A. C. Blackwell	" " " 2
" 662	Sgt. R. M. Carter	" " " 2
" 228	Sgt. G. A. Farrow	" " " 2
" 494	Sgt. H. R. Leaver	" " " 2
" 539	Sgt. J. A. McLellan	" " " 2
	Lieut. J. C. Broom	" " " 3
" 780	Sgt. E. Marshall	" " " 3
	Capt. A. M. Strang	" " " 4
" 668	Sgt. A. Ouimet	" " " 4
	Capt. Arthur Viets	" " " 6
" 721	Sgt. Homer Oral Lord	" " " 6
	Capt. C. W. McIntyre	" " " 10
	Capt. F. J. Moffatt	" " " 10
" 866	Sgt. A. R. Ezard	" " " 10
" 851	Sgt. R. H. Snyder	" " " 10
	Capt. M. C. Bagnall	" " " 11
" 531140	Sgt. J. R. Cruickshank	" " " 11
	Capt. C. H. Cowan	" " " 12
" 732	Sgt. N. F. R. Wheatley	" " " 12
	Capt. E. P. Harkshaw	" " " 12
" 418	Sgt. W. H. Overton	" " " 12

REMOVAL OF RUST FROM INSTRUMENTS.—The rusted instruments are laid in a solution of tin chloride, preferably hot, and afterwards rinsed in clear water. Abrasives remove the polish.—*E. D. Spears, Journ. Amer. Med. Association.*

Dominion of Canada Income War Tax Act, 1917

THE act to authorize the levying of a war tax upon certain incomes, has been rendered necessary, because of the unusual national expenditures in connection with the prosecution of the war. Canadians, who have not joined the active forces, and whose incomes are within the schedule named, should gladly welcome this opportunity of assisting to defray the Dominion Government war expenditure.

This magazine has received many enquiries from Canadian dentists regarding the operation of the Act, as it applies to dental practice. In every case there has been shown a disposition to learn the facts regarding the tax, that a fair return may be made. In no case was a disposition shown to evade, in any way, the provisions of the Act or to avoid the just and proper share of the individual under the Income War Tax Act.

All income returns should have been made before 1st April, 1918, but owing to misunderstandings a number of men have not yet made their return, and this article is now published for the information of these.

Returns showing the annual income of individuals, should be made upon the forms provided. These may be secured from the local post office. The tax is levied upon net income received during the twelve months ending the 31st of December, 1917. Exemption is provided amounting to \$1,500, for unmarried persons (and widows or widowers without dependant children) and \$3,000 in the case of all other persons. A 4 per cent. normal tax is to be paid on the total income over these amounts, and in addition thereto a supertax, on a sliding scale, varying from 2 up to 25 per cent. on taxable incomes amounting to \$6,000 and over, according to the sum involved. Where the income is \$100,000 and over the supertax is 25 per cent., while taxable incomes of \$6,000 to \$10,000, bear a supertax of but 2 per cent.

Enquiries at this office would indicate that there is much uncertainty among the members of the profession, as to what items are properly included in office expenses. For the general information of the profession the following items are named as those which may be legitimately included:—Office help and janitor's service; laboratory expense; dental supplies; telephone, light, heat, etc.; rent and general office upkeep; fire, accident and sick insurance; dental convention expenses; dental literature and office donations to charities; annual depreciation of 20 per cent. on office equipment and furnishings.

Changes and improvements in dental equipment and instruments are so frequent, that an amount should be written off each year as an ordinary expense, which would enable the dentist to "scrap" his entire equipment in five years. If spent each year, such a sum would

maintain the office and equipment at the point of maximum efficiency.

When the operator is absent from his office through sickness, accident, or other cause, his earning power ceases until his return. Every dentist should, therefore, carry a policy of insurance indemnifying him against loss, should his earning power be thus suddenly interfered with. Such a policy, returning \$50.00 per week in case of disability, costs \$120.00 per year and should be purchased by every dentist and the premium charged as a regular office expense.

Where the gross annual income derived from a dental practice is less than the exemption named in the Act, no return need be made, but where this amount is greater than the exemption, the dentist should make his return, claim legitimate exemptions and deductions, and file such return with the official appointed for that purpose.

Obituary—Dr. J. R. Callahan

THE entire dental profession has suffered a distinct loss in the death of Dr. Callahan. Through his self-sacrificing researches he added much to the science and practice of dentistry, and was known throughout the dental world as a careful and scientific investigator.

At Rochester in May, 1917, Dr. Callahan was awarded the Jarvie Medal in recognition of the scientific researches he had made, previous to that time.

At the recent meeting of the Toronto Dental Society Dr. Weston A. Price paid tribute to Dr. Callahan as an associate in the work of the Research Institute. Dr. Price said:—

"I must pause for a moment to pay sincere tribute to our late friend and lamented brother, Dr. Callahan, who died just a few weeks ago. He went to bed about nine o'clock at night, in the prime of health, or as good health as he has had for years, and did not awaken to go to his office in the morning, and probably died almost instantly he had gone to sleep. Apparently he had died after having read a few chapters from his book on the Histology of the Structures of the Supporting Tissues of the Teeth. He had folded the book, put in the book-mark, laid the book over on the pillow on the other side of the bed, folded his glasses and laid them on top of the bed, put his blanket carefully over his shoulder, and laid on his right side, (as he always did), and went to sleep. The bedding was not disturbed a particle in the morning. He had gone to sleep and had not awakened."

In the passing of Dr. Callahan, Dentistry has lost one of her great sons who, though he has gone on, has left an enduring memory of his splendid achievements, and the great personal sacrifices he willingly made for his chosen profession.

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, APRIL, 1918

No. 4

EDITORIAL

Efficiency of Dental Medicaments

ELSEWHERE in this issue is published the report of an address delivered before the Toronto Dental Society by Dr. Weston A. Price. We reproduce herewith a letter, recently received from Dr. Harold Clark, Toronto, referring at some length to Dr. Price's address. Dr. Clark's letter is so timely that we publish it in full:—

"Dear Mr. Editor:

"Of all the meetings of the T. D. S. during the past winter surely the most remarkable was that where we listened to Dr. Price. While everyone of us was intensely interested, it is doubtful if any of us came away without a feeling of depression and discouragement. Many, no doubt, were in sympathetic agreement with the boy who answered his own riddle of existence, "What's the use of anything? Nothink!" And speaking of riddles, some one has answered the riddle. "Is life worth living?" by saying that it depends on the liver. While admitting both the wit and the wisdom of the reply, I would like to proffer another, "It depends upon life's achievement." The joy of living and working is measured by our sense of achievement, and the dentist, until recently, could feel a high degree of recompense for his labor in his power to achieve the nearly impossible. But the

past three or four years have given us many bumps and jolts, and the danger that an epidemic of discouragement may lay its hand on the profession, is a real one, and Dr. Price's paper made many feel that Hindenburg had at last broken through.

"It has occurred to me that it might be wise to come back and look at the wreckage and see if there are not some pieces left that are worth carrying away.

"In his opening remarks Dr. Price said: 'It has been a very great disappointment to us in making these researches to find that many of the things that we thought were so, are apparently not so. I say "apparently" because it is always within the range of possibility that there is some new phase of this problem we have not understood, we may not have had a sufficiently large number of experiments, we may not have checked our work carefully enough. However, we will leave it for you to be the jury, and I simply present to you the evidence as we have it, and you will make your own conclusions.'

"If, from the paper we don't see a better choice of medicaments and manner of using them than our present routine, we shall just have to 'carry on' as before, till we know we have something better. Dr. Price does not claim that his findings are final, and further investigation may reveal an odd missing link here and there, that will account for the good results in our experience, in spite of his findings up to date. Let us remember that within a matter of months we were informed that we were near-slackers in our dental work if we failed to convince ourselves, with X-ray proof, that our canals were all filled to the apex with gutta percha, and a well proportioned button of the same material superimposing the root end. Now, we know, that while this is clever, it is bad, inasmuch as it causes future culture pabulum at the apex for the ubiquitous 'strep.'

"Dr. Arthur Black, in his talk to our Society, told us recently, that in the examination of many X-ray films, it was found that 67 per cent. of teeth with root canal fillings of all kinds, showed apical infection, but that where the length of the canal filling and other characteristics suggested careful work, the percentage of trouble dropped to 8 per cent. Nothing was known of the medicament, or the aseptic precautions, in this 8 per cent. failure. With an approach to our best ideals in canal work, the 8 per cent. may easily be reduced very close to the vanishing point.

"Dr. Price's paper should serve a valuable purpose in enabling us to make a more intelligent selection of medicaments for sterilizing root canals.

"The methods tested by Dr. Price, that gave high efficiency, all had some objectionable feature. With further investigation and experience we may retain the efficiency and overcome the objections. Formalin proved to be in the high efficiency class, but it is irritating. The Howe method with Ammoniated Nitrate of Silver and Formalin,

is also in the H. E. class but it discolors. Oxychloride or Zinc is a H. E. root canal filing but its hardness forbids removal. Dichloramin T. is perhaps top-notch for sterilizing infected roots, but it is also top-notch as an irritant. Yet there are those using it who have overcome its irritation. Again, there are those who employ a technique with Formalin that makes its irritation negligible. Oxychloride of Zinc may be so modified that it will be so friable that it can be removed from the canal if desired.

"Instead of being discouraged with our root canal work we should feel, that with Dr. Price's addition to our working knowledge of medicaments, we should be able to reach a little nearer to the goal of perfection."

Yours very truly,

HAROLD CLARK.

Researches conducted upon extracted teeth, are always open to very serious objection. Entirely different results may be obtained by similar treatment in the mouth. Dr. Price himself, has clearly shown that our successes in the past are to be largely attributed to the beneficent influence of Nature. It will ever be so, no matter what the treatment or medicament used. A 100 per cent. germicidal efficiency in a medicament, used in an extracted tooth, means little or nothing unless we know that the medicament in similar strength will not harm or destroy living tissue cells. Should our 100 per cent. efficiency medicament, even lower the vitality of living tissue, our great ally, Nature, will be hindered rather than helped.

And furthermore, is it not possible that our very successes in the past, have been due to our use of the so-called "low-efficiency" medicaments, thereby assisting Nature, without destroying or minimizing her effort by the use of strong drugs? Dr. Head, in his recent book on Modern Dentistry, refers to the researches of Ehrlich, who found that syphilis germs, exposed to the action of Salvarsan, were neither destroyed nor rendered in any way different in appearance or activity, but that they were nevertheless sensitized, so that the leucocytes could "eat" them in a way impossible to syphilis germs not so subjected to Salvarsan. Ehrlich then formulated the principle that germs might be sensitized by a comparatively inert drug, so that the bacterial action of the tissues or blood might digest them.

Might not a non-germicidal "inefficient" medicament, acting upon the same principle, be "efficient" in the treatment of infected teeth? That is to say, in the laboratory test, it might be shown that infection remained after the use of the medicament, and yet the action of the drug, when used in the mouth, might so sensitize the bacteria, that Nature could then cope with an infection that she otherwise could not overcome. To insist upon medicaments that are germicidal, perpetuates our present error of overlooking the beneficent influence of

Nature and our failure to make her work 100 per cent. efficient. What we really need after all, is Nature at 100 per cent. efficiency—whatever may be said of our medicaments.

Combined C.D.A. and N.D.A. Convention

ORAL HEALTH is in receipt of a letter from Dr. Sydney W. Bradley, Secretary Canadian Dental Association, requesting that we announce a joint meeting of the Canadian Dental Association and National Dental Association, to be held in Chicago, from August 5th to the 9th, 1918.

The very cordial and generous invitation of the members of the N. D. A. to the members of the C. D. A. to attend the Chicago meeting as guests, has been promptly and graciously accepted by the officers of the Canadian Dental Association.

It had been hoped by many members of the Dental Profession that the C. D. A. would, this year, meet in British Columbia, in honor of British Columbia's entry into the Dominion Dental Council. However, in view of the foregoing plan, we venture to predict that the B. C. men will willingly permit their invitation to the C. D. A. to hold its meeting in Vancouver this year, to stand over for future action.

What a great idea it is, for Canada and the United States to get together as allies in a joint dental convention, for mutual benefit, inspiration and advancement? Here's hoping this great meeting may be the best ever.

Advance in School Dentistry at Vancouver

THE School Board of Vancouver City has recently added another School Dental Clinic, equipped for two operators. The Dental Staff now numbers four men, two at a Central Clinic and two in Fairview District. The School Dental Officers are:—

Drs. R. L. Pallen, W. A. Fergie, J. S. Sproule, W. A. Loveridge.
Dr. J. E. Black is now a member of the School Board.

Officers of the Toronto Dental Society, 1918-19

Hon. President.—Dr. W. B. Amy.

President.—Dr. J. E. Rhind.

First Vice-President.—Dr. R. D. Thornton.

Second Vice-President.—Dr. A. S. Thomson.

Secretary.—Dr. W. H. Coon.

Treasurer.—Dr. H. M. McKim.

Auditors.—Drs. W. E. Willmott, J. A. Bothwell.

Accomplishing the Impossible

MANY problems, considered for centuries as impossible of solution, have been solved by men of great vision, faith and industry.

TO attempt the impossible may mean failure, but what mortal can predetermine whether the "impossibility" is real or only apparent?

THE Dental Profession and humanity owe a great debt of gratitude to those who have had the courage, resource and stamina, to tackle the many unsolved problems of Dentistry, whose solution may, upon the surface, have appeared impossible. The Profession delights to doubly honor those who have been successful in the attempt.



JOSEPH S. GRAHAM, M. B., M. R. C. S.

*Professor of Pathology, Royal College of Dental Surgeons of
Ontario.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, MAY, 1918

No. 5

The Removal of Septic Foci in Case of Chorea

JOSEPH S. GRAHAM, M.B., M.R.C.S., TORONTO.

THE title of this paper should rather have read, The Avenues of Infection in the Mouth with Regard Especially to the Teeth.

The work was done on cases of Chorea and Rheumatism with their complications and sequelae and, while we are able to note the effect on the patients of the removal of septic foci in the mouth, yet the work on the teeth proved to be so interesting and instructive to us, that I have prepared a series of lantern slides demonstrating the manner in which the teeth act as a portal of entrance of infection in these cases. In this article I have referred to Chorea as a condition separate from rheumatism. This has been done as a matter of convenience.

Nearly two years ago the writer had a remarkable series of three cases of Chorea in children, which cleared up immediately after the removal of infective foci. In the first case a girl, M. S., had been in the Hospital for Sick Children for about one year. She was admitted as a case of acute endocarditis. Her condition improved slowly and after three months we decided that the heart affection was practically cured and that she should be allowed to go to her home. About this time she developed Chorea, for which she was treated, but not with good results. She was sent to the Island Home, where she gained weight, but the Chorea persisted. On her return from the Island I was surprised to find an Encysted Empyema, which, it must be confessed, had been overlooked. The patient had had a rib resected a year previously for Empyema. Dr. Starr resected a rib and an ounce and a half of fetid pus was removed.

The next morning the Chorea had disappeared completely. Cultures from the pus were negative.

The other two cases were of children who developed appendicitis during an uncomplicated attack of Chorea. In each of these cases the Chorea disappeared a few days after the operation. Unfortunately in neither of these cases was a culture made from the appendix.

The first of these cases led me to believe that, following the initial rheumatic infection, which may or may not have had its original point of entrance at the Pleura, the symptoms of Chorea might continue to manifest themselves on account of toxic absorption after all general infection had disappeared from the blood stream. The other two cases possibly show the appendix as the primary infective point. Shortly after this we decided to carry out, at the Hospital for Sick Children, a definite plan of treatment in our cases of rheumatism and chorea, complicated and uncomplicated by heart lesions. The tonsils, in the cases uncomplicated by heart lesions, were removed by Dr. Boyd if found to be diseased. He based his conclusions as to whether or not the tonsils were diseased on these points:

1. When there was marked enlargement of tonsils, showing reaction with or without enlargement of cervical glands.
2. When there was enlargement of cervical glands without much reaction in the tonsil.
3. When he was able to express pus as well as debris from the crypts.
4. When the free attachment of the anterior pillar was engorged and of a deep red color.
5. In certain cases after all other sources of infection were eliminated.

X-ray pictures of the teeth were made and those which showed evidence of infection, were removed by the hospital dentist. Only one tooth was removed in a single day; after any reaction had subsided a second tooth was removed and so on until all teeth with septic foci had been accounted for. Treatment was also given the gums when necessary.

In the patients with an active heart condition the temporary teeth were removed as in the uncomplicated cases. The tonsils and any diseased permanent teeth were left until the heart lesion had subsided. This plan of treatment was carried out in sixty cases of chorea and in chorea rheumatic infections. In some of the cases, which did not show marked improvement at the end of two weeks, it was found necessary to use arsenic. This was given in fairly large doses over a short period of time. After a week's interval a second course was given, if necessary. The number of cases so

treated were under twenty per cent. This I shall deal with again when going over some of the conclusions that might be traduced from our work.

The tonsil, as the point of entrance of rheumatic infection, has long been recognized and the presence of septic foci in the tonsil from which repeated bacterial invasion of the blood stream may take place, has been known for some time.

The work on the tonsil by Harold Hayes Wood of Philadelphia, and Jonathan Wright of New York, both from the standpoint of rheumatic infection and as a portal of infection other than rheumatic, is so complete and convincing I shall give no time to consideration of this organ.

Similarly the teeth and gums, as the point of infection in rheumatism of adults has been worked out. Dr. Detweiler, of Toronto, has done specially good work in this direction. He found that in 83 per cent. of the cases in which there are the so-called blind abscesses, that he was able to grow the streptococcus viridans. These strains were injected into rabbits, producing heart and joint lesions. The teeth of children seem to have been overlooked as a possible source of infection and it is from this standpoint that I would like to show this series of slides.

The medical profession has been too apt to leave the care of the teeth and diagnosis of tooth conditions entirely in the hands of the dental men. This, I think, has been a mistake, as it is only by co-operation that the best results will be achieved. For the past seven years the writer has been connected with the dental college teaching histology and pathology, and finds in and about the teeth an increasingly large field for investigation. Medical men are too apt to speak of all tooth infection as "pyorrhoea" and give too little attention to the conditions of the pulp and tissues about the ends of the roots. With your permission a few slides will be shown, some of them diagrammatic, in order to illustrate the normal histology of the tooth and surrounding parts. The sections have been ground or sectioned and photographed by my assistant, Dr. Box, and myself, and are from specimens obtained at the hospital. I would here like to acknowledge the kindness of Dr. Box and Dr. Richardson, who is in charge of the Dental work at the Hospital for Sick Children.

The X-ray plates were taken at the Hospital for Sick Children as a routine procedure in our cases of Chorea and Rheumatism:

1. Shows the relation of the hard tissues, the relative thickness of enamel, dentine and cementum, also the size of the pulp chamber compared with the dense tissues surrounding it. In the temporary teeth the pulp is relatively larger than in the permanent. The bulk of the tooth is formed of dentine. In the mouth the dentine is covered by enamel, whereas in the roots of the tooth, the dentine is covered by cementum which affords attachment to the fibres of the periodontal membrane holding the tooth in position.

2. Shows the temporary teeth. There are no bicuspidis in the deciduous teeth. The temporary molars are the teeth usually affected in children. On account of the fact that little attention is paid to these deciduous teeth and to

the fact that caries is extremely rapid in children, these teeth are frequently lost before normal absorption occurs, causing irregularities, contracted arches of the mouth and floor of the nose.

3. Shows the root of a tooth in position. This is not a temporary tooth but a diagram showing the crown, the blood and nerve supply of the pulp and peri-dental membrane. The difference between this tooth and a temporary tooth lies in the fact that there are present in this cementum many lacunae, whereas in the temporary tooth the cementum is of a homogeneous nature and very thin. The fault in this diagram lies in the fact that the cementum appears above the gum, whereas normally, both in temporary and permanent teeth, the attachment of the gum marks the commencement of the cementum. The sub-gingival space is also shown, but this will be referred to later.

4. Shows the point of junction of the enamel and cementum. It is at this point that the gum is attached and here we have caries frequently commencing on account of the retention of food particles in the subgingival space. Following the loss of a small amount of enamel, a series of open tubules afford a path of infection directly to the pulp. The manner of termination of the dentinal tubules is also shown. This further demonstrates that in children there are few, if any, lacunae in the cementum tending to prevent infection travelling from without in, or from within out. The interglobular spaces are shown. These are due to defective development and are more numerous in children than in adults, and partly explains the progress of caries in children.

5. Shows the method of termination of the tubules at the cemental junction. Again note the absence of lacunae.

6. Shows the amelo-dentinal junction and the manner of termination of the tubules. It is when infection reaches this point that its progress is rapid and when reaction occurs in the pulp and the surrounding tissues. Dr. Box, working in the laboratory of the dental college, has shown the presence of the nerve fibrils in the dentine for about one-third of the course of the tubules. It is our opinion that when we have a better method of fixation that the nerve fibril will be demonstrated as far as junction of the dentine with the enamel. Besides the nerve in the tubule we have the dentinal fibril, which in life, probably occupies the whole of the tubule and is attached to a large cell in the margin of the pulp, the odontoblast cell.

7. Is a slide under oil immersion and shows the dentinal tubules, the fine ramifications and the relative width of the matrix. This demonstrates how infection may spread in a lateral direction.

8. Again shows the manner of termination under the cementum and the fact that there are more numerous branches near the termination.

9. This is a picture of the subgingival space, lined on one side by Naysmiths' membrane, which is probably a residue of the enamel organ, on the other side by a thin layer of Squamous Epithelium. Note the relative thickness of Epithelium on the two surfaces as this has a distinct bearing on infection.

10. Shows the alveolar process further down, and gives a fair picture of the relation of cementum, periodontal membrane and alveolar process.

11. Is a picture specially prepared to show the direction of the fibres in the peri-dental membrane. The upper are known as the alveolar crest group of fibres. This periodontal membrane is a periosteum and practically it is in this tissue that we have the suppurative process known as the pyorrhoea alveolaris.

A path of infection may follow the formation of a plaque or occur through the crown of the tooth on account of the fissures in the temporary molars due to developmental defects. This latter course is the more frequent in children.

12. Shows an accumulation of debris in a fissure. The cone-shaped area of disintegration is broken down enamel.

13. Shows a later stage in which a considerable amount of enamel has been lost and infection of the dentine has occurred.

14. Oil immersion photograph showing pipestem tubules in which an infection has occurred. These organisms are probably saprophytic. The tubules will be broken down with the formation of liquifaction foci. These will coalesce and later there will be loss of dentine and exposure of the pulp.

15. Here we have infection of the tubule following the loss of enamel. This has occurred under a plaque at the gum line. Note the fact that the infected tubules stand out prominently against normal dentine.

Depending on whether the progress of caries is rapid or not we may or may not have the formation of secondary dentine which is really a walling off process. This formation of secondary dentine is likely to be seen in children on account of the rapid progress of the disease.

16. This is a photograph of a section, stained by Vangiensa stain, showing a reaction of the pulp to advancing caries. Secondary dentine is shown. This secondary dentine is not a perfect barrier against the advance of caries. This also shows engorgement of the blood vessels.

17. The great vascularity of the dental pulp, the delicate structure of the walls, of the blood vessels and the semi-fluid nature of the matrix, together with the absence of collateral circulation renders the pulp very susceptible to circulatory changes. The fact that there is only one outlet and the fact that it is encased by a bone-like wall, renders it liable to death through strangulation, with or without infection.

18. Early infection of the pulp showing vascular disturbances following disturbance of innervation of dentine.

19. There is nothing special in this section excepting the presence of pulp nodules, seen frequently in children and apparently are factors in the protection of pain. They are seen frequently in a sheep's teeth, and where no caries has occurred.

20. This section shows the loss of dentine and exposure of the pulp. The superficial loss of tissue is marked. Thrombosed blood vessels are seen, and at the lower part of the slide small cell infiltration. The disease persists until the whole of the pulp in the pulp chamber is lost, after this follows death of the pulp tissues in the root canals.

21. Shows the relation of peridental membrane to the apex of the tooth. In the slide below the point where this picture was taken, there was a definite walling off of the infected area by connective tissue. Note the peculiar arrangement of the Epithelial cells which have developed from the sheath of Hertwig of the enamel organ. This is known as the so-called blind abscess, and it is from this point that we have general infection occurring.

22. Another avenue of infection is through the gum at the side of the sub-gingival space. This slide shows small celled infiltration at this point.

23. Is a slide from the same section, taken at a lower level, and shows a course of absorption of the alveolar crest, this generally precedes pyorrhoëa.

24. An X-ray picture showing the size of the pulp in children. This shows the erupting second bicuspid and a second temporary molar being shed. Note how absorption of the roots has taken place without the presence of any infection. The child is about seven years old.

25. Shows a cavity in a permanent tooth. The infection is seen spreading in from the side of the tooth through a fissure. This picture is taken at the same point in the mouth as the preceding one. The second bicuspid has erupted. The child is eight years of age.

26. The same position in the mouth, showing the early loss of the crown of the second temporary molar through caries. These two roots are below the gum margin and are infection foci.

27. The next two pictures demonstrate practically the same conditions. In this picture, on one of the roots we find an infected area.

28. This section shows fragmentation of the tooth due to caries with a more advanced infection.

29. Is a temporary molar tooth with an area of rarified bone at the roots; sometimes spoken of as a granuloma.

30. Shows a first temporary molar in which death of the pulp has occurred. The disease is extending to the tooth beside it.

31. Shows marked disease of temporary teeth.

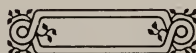
32. Shows a condition where a first permanent molar has become involved. Note the indefinite outline of the pulp chamber. This condition will be shortly followed by infection at the end of the roots of this tooth, which erupted at six years of age and is frequently mistaken for a temporary tooth.

In my series of sixty cases of chorea, complicated or uncomplicated, there are only four in which I feel that it has been proved that the primary forces of infection were in the teeth alone. One of these, E. H., age seven, complained of pain in a permanent molar toward the end of last summer. The tooth was treated and filled. In October the boy developed an acute endocarditis, during the course of which both chorea and rheumatic manifestations were seen. It was after his partial recovery that he was removed to the hospital and an X-ray picture of the teeth taken. This showed a lack of outline of peridental membrane on this tooth, and at the root there appeared to be a small abscess cavity. The roots of the teeth had

not been filled. He improved rapidly after extraction of the tooth. Cultures showed streptococcus viridans. During the past four months he has had no return of symptoms. The right tonsil which, I thought, was also diseased, was on the same side as the infected tooth. During his illness it was engorged and on occasion he would complain of pain when swallowing. These symptoms completely disappeared after the removal of the tooth. I asked Dr. Richardson, who also has charge of the extraction of teeth in the public schools, to send me a brief report in answer to a series of questions. He states that in the temporary teeth, where there is a focus of infection, the child may or may not complain of pain. Many of those who have no pain have sinuses opening, usually in the buccal side, from which the exudate escapes. He also states there are very few cases of Chorea that have come under his observation in the hospital or in the schools, in whom there have been no diseased teeth. He further states that there are a great number of children with abscessed teeth, apparently not suffering from any disease, yet they are, as a rule, more irritable and of sallow complexion, and are not as advanced in school as their age would warrant. The one exception would seem to be the Jewish race, of whom he says: "They seem to be far more susceptible to caries, but are affected less frequently with the disease conditions which are seen as a sequel to diseased mouths in our race."

CONCLUSIONS.

1. That the infective focus of Chorea and Rheumatism may be the teeth.
2. That the streptococcus viridans has been grown in over sixty per cent. of the cases without sinuses.
3. That a diseased condition of teeth is probably responsible in many cases, for long continued and frequently recurring cases of Chorea.
4. The length of stay at the hospital of cases of Chorea, and in those of Chorea complicated by Rheumatism, but with no active heart lesion, was reduced one-third.
5. That the removal of Septic teeth in cases of active endocarditis does not promise to give brilliant results. Sufficient time has not elapsed nor has a sufficient number been so treated to warrant any statement in this regard.



Medical and Dental Education in Ontario

FRED. J. CONBOY, D.D.S., TORONTO.

THE Ontario Government on September 29th, 1915, commissioned Mr. Justice Hodgins to inquire into and report upon the status of the medical and all allied professions and callings. His report, which has just been presented, is of great interest to the dental profession. The first matter taken up is that of physical treatment and the Commissioner points out that in the treatment of maimed and disabled soldiers, the great benefits derived from Physiotherapy have been abundantly proven. Under this head he includes:

Mechanotherapy—Treatment by mechanical appliances;

Thermotherapy —Treatment by heat;

Hydrotherapy —Treatment by water;

Kinesitherapy —Treatment by movement, re-education in walking, gymnastics and massage;

Electrotherapy —Treatment by electricity;

Radiumtherapy —Treatment by radium emanation.

Many cases of wonderful cures are cited and statistics given to prove that in the vast majority of cases the treatment is successful. The Commissioner recommends the establishment of an institution of Physical therapy upon the grounds of the Toronto General Hospital and the installation of a proper department at the University for the training of students and graduates in this most useful branch of medical work.

In that part of the report dealing with Osteopaths the Commissioner points out, that there are no osteopathic schools in Canada, and that all those who practice here are graduates of a college in the United States, and that consequently the Province has no supervision over the standard of training. He regards it as undesirable to have two standards for medical qualifications, and therefore recommends that after July 1st, 1918, no one shall be allowed to practice medicine without a license from the College of Physicians and Surgeons, but makes special provision for those who were practising osteopathy on the 30th of June, 1913, the time when the late Premier Whitney made his promise to institute an investigation.

In regard to Chiropractors the Commissioner states that the theory sustaining the system presumes that in consequence of displaced vertebra the intervertebral foramina, through which the nerves pass, are closed; thus pinching the nerves, and that such pinching is responsible for 95 per cent. of all diseases. Chiropractic concerns itself with an adjustment of the subluxation, thus renewing the pressure on the nerves. The Commissioner refusing to sanction the practice, says:

"I cannot bring myself to the point of accepting as part of our legalized medical provision for the sick, a system which denies the need of diagnosis, refers 95 per cent. of all diseases to one and the same cause, and turns its back resolutely upon all modern medical scientific methods as being founded on nothing, and unworthy even to be discussed."

Provision is made in the report for the better training of Optometrists, the necessary course being taken at the Technical School; for the training and registration of registered or graduate nurses; and for the establishment of home nursing associations to provide nurses for the care in their homes of the sick and their families.

Considerable space is given in the report to a discussion of the relation of the Ontario Medical Council to the University of Toronto, but the only radical change suggested is the appointment of a Medical Director, who shall inspect the medical schools and hospitals and make special provision for the benefiting, in a medical way, of the returned soldiers. It is suggested that this officer be connected with the Department of Education.

The reference to dentistry is most complimentary, the following words being used: "The School of Dentistry established by and under the control of the Royal College of Dental Surgeons of Ontario, is, so far as I can judge, fulfilling its function satisfactorily." The findings of the Commissioner in regard to a Taxing Officer and a uniform tariff, are in the main in accordance with the views of the dental profession. He concurs in the contention that it would be impossible to arrange a fixed tariff, and while recommending a special officer to overcome the publicity and unpleasantness of a law suit in cases of disagreement between dentist and patient in the matter of fees, impresses upon the Provincial Government that the appointee be a competent man of experience and judgment, and that in the appointment, the concurrence of the profession be sought. The weak point in the report, as far as dentistry is concerned, lies in the recommendation that the net fees from examinations be handed over to the medical faculty, to be used in the interests of medical education. We feel certain that this recommendation was made without an accurate knowledge of the relationship existing between the Dental College and the University, or of the fact that the College has never received one dollar by way of a grant from either the University or the Provincial Government. The profession realizes that dental students should receive a more thorough training in matters of general health and disease, and that such instruction can best be given in a hospital. Efforts have been and are being made to establish a dental department at the Toronto General Hospital, and it is to be hoped that the profession will give its undivided and enthusiastic support to this project.

The report as a whole shows careful investigation and thoughtful

consideration, but many difficulties must be overcome before its benefits can be realized. One fails to see how the subjects recommended can be added to the already overcrowded curriculum of our colleges without radical re-organization. We know full well that in the medical and dental education of the day there is considerable overlapping, and in consequence a material waste of time, energy and money. It would appear advisable for the University to arrange a preliminary course, which would serve as a basis or foundation for all branches of dental and medical training, and after the completion of this course, the student might continue on into general medicine or branch out into his chosen specialty.

Royal College of Dental Surgeons of Ontario and the War

SINCE the commencement of the war a total of one hundred and eighty-four students of the Royal College of Dental Surgeons have enlisted in the Canadian Expeditionary Force. These men have, in the matter of standing, been treated by the college with every possible consideration. Arrangements have been made each year, after a certain fixed period in the term, to hold special examinations for those who desired to enlist before the close of the session.

During the summer of 1916, special Third and Fourth Year sessions were held, for the purpose of advancing the training of these men; and thus preparing them for service, either as graduate dentists in the Militia, or to serve the public in those districts where dental practitioners had enlisted and a serious public need for dental service existed.

During the fall of 1916, the Militia Authorities at Ottawa reported that there had been requisitioned for service in the Canadian Army Dental Corps overseas, drafts amounting to two hundred dentists, two hundred and seventy dental sergeants (laboratory assistants), and two hundred privates. This demand for trained laboratory assistants was greater than the total number of men in Canada available for such service.

To meet the situation the Militia Department considered the organization of a dental sergeants' training school in Ottawa. Had this plan been carried through, a great deal of expense would have been incurred for equipment and instruction. Students would have been trained at the public expense, and very few of them doubtless, would have held preliminary qualification permitting them to proceed with a regular Dental College course at the conclusion of the war. The offer of this college to secure and train recruits for this purpose resulted in the abandonment of the plan to establish a Military Dental School.

In answer to this special call fifty students of the Royal College of Dental Surgeons, offered their services, were given special instruction and were enlisted as sergeants about the 1st of February, 1917. These students were granted standing in their year. Furthermore, the college arranged with the Department of Militia to secure a group of young men from the Matriculation Classes of the High Schools of the Province, permit them to take a special dental course and grant them First Year Standing, upon evidence of enlistment and favorable recommendation of the College Faculty. This special class, composed of seventy-four men, was organized during January and commenced work on the 5th of February, 1917. It was decided to conduct, if time permitted, at least a five months' course. Even in that period it is quite impossible to train a man as an expert dental laboratory assistant. Notwithstanding, however, within three months from the commencement of the course, the Militia Department called out twelve of the class for overseas service, and the balance continued at college until the end of June.

In the meantime voluntary enlistment in Canada had almost ceased and, consequently, the balance of these dental sergeants were not immediately required and were sent to Camp Borden for military training. These men are now proceeding with their work at the college, and are subject to call at any time. This unforeseen delay is proving an advantage, as it gives the necessary time to properly train these men and make their work as Dental Sergeants much more effective.

For the session 1917-18, it was decided early in February, and confirmed at the meeting of the Board of Directors in May, 1917, that the following regulations be adopted governing the registration of Freshmen Students for the session 1917-18:—

That for the session 1917-18, every Freshman student who is physically fit for military service, be enrolled in a special First Year Class for special training in the work of a dental sergeant; such student to hold himself available for service in the Canadian Army Dental Corps as required.

That Freshmen students who are not physically fit for military service be enrolled in the regular First Year Class. There being a great need for dentists in civil practice, candidates unfit for military service, will be permitted to proceed to graduation in the regular course.

As a result of these regulations quite a number of applicants refused to register. However, every student, without exception, was compelled to sign an application embracing the above agreement, no matter what his age.

All dental students in all classes are compelled this year to take military drill, unless excused for good cause. About two hundred

and forty dental students have enrolled in the University of Toronto Officers' Training Corps in L Company, under command of Lieutenant W. E. Willmott.

The University and the College have worked in the closest harmony and co-operation in regard to the conduct of dental studies and all regulations that have been adopted apply equally to both the Dental Department of the University and the Royal College of Dental Surgeons.

The Difference Between a Trade and a Profession

WILLIAM J. GIES, NEW YORK.

TRADER (2) is conducted primarily to secure individual advantage or profit in sale, purchase, or barter. This is exchanged for that. The one who offers the commodity aims frankly to obtain equal or greater worth in return; the one who accepts the commodity has avowedly the same purpose—to "get his money's worth," and more, if possible. In the mutual desire of seller and buyer fairly (3) to obtain from each other as much as possible (the inherently personal and selfish feature of trade), prices usually register the equilibrium between opposing purposes to obtain the maximum value for self—the balance between the give-and-take of "supply and demand."

The one who offers merchandise for sale usually knows more about any existing deficiency in the goods than does the buyer (before the sale), and the seller does not invariably tell all he knows in this regard while the prospective buyer reflects upon the possible advantages, to himself, of purchase. When the trader's business is advantageous to the community, such service as he renders is usually, so far as he himself is concerned, incidental to his primary purpose to sell goods and to "make money." The tradesman is seldom in

(2) "A trade is, specifically, the craft or business which a person has learned and which he carries on as a means of livelihood or for profit; occupation; particularly, mechanical or mercantile employment; a handicraft, as distinguished from one of the liberal arts or of the learned professions, and from agriculture. Thus, we speak of the trade of a smith, of a carpenter, or of a mason; but not of the trade of a farmer, or of a lawyer or physician. . . . Trade is the exchange of commodities for other commodities or for money; the business of buying and selling; dealing by way of sale or exchange; commerce; traffic. . . . A tradesman is a person engaged in trade; . . . a man having a trade or handicraft. . . . A trader is one who is engaged in trade or commerce."—Century Dictionary.

"For the buyer a hundred eyes are too few, for the seller one is enough." "If you would not be cheated, ask the price at three shops." "It is the very life of merchandise to buy cheap and sell dear." "Pity and compassion spoil business." "Profit is better than fame." "The man of your trade is your enemy." "Trade is the mother of money." "Trade knows neither friends nor kindred." "No one will get a bargain he does not ask for."—Proverbs, maxims and phrases (Christy).

(3) "If the other fellow fails to keep his wits about him, however, it's his own funeral." Business is business."

"business for his health" or generously for the benefit of the community. Too often his motto is: "The public be damned." Trade is essentially and frankly selfish, though it need not be objectionably so. When it is conducted openly, fairly, and squarely, trade affords, by common consent, a livelihood that is creditable to, and honorable for, the one who achieves it. Such trade is a convenience or a necessity in every community. High degrees of productiveness of the farms; intensive conduct of, and contentment in, the industries; and wide extension of voluminous trade in useful products, afford the substantial basis for a nation's prosperity, and foster the public service that the professions accomplish.

Every profession is conducted primarily for the avowedly generous performance of highly trained service. (4). The professional man performs this service for that remuneration—and he aims to give, in each instance, greater worth than the value he receives in return. The professional man, unlike the tinker, plumber, or other tradesman, understands that nearly all his professional knowledge was originally established by altruistic research, by public spirited discovery, by unselfish invention, by free and privileged professional communication, and through the expenditure of large funds from public or philanthropic sources. The professional man realizes that much of his professional training and skill was initially derived from instruction by underpaid teachers who, as professional educators, gave him that instruction as a part of their public service. The professional man is aware that his professional efficiency and opportunity depend upon these and other types of generous gifts to him and, through him, to society; he sees clearly that the money paid by him for his professional training was not, and could not have been, a payment in full for value received. (5). The professional man comprehends, therefore, that he is "a debtor to his profession" and, through his profession, a debtor for life, also, to society—to society, which is the abiding trustee of the special knowledge the professional man is encouraged and assisted to acquire and to use, under the state's regulation and jurisdiction, primarily

(4) "A profession is the calling or occupation which one professes to understand and to follow; vocation: specifically, a vocation in which a professed knowledge of some department of science or learning is used by its practical application to affairs of others, either in advising, guiding or teaching them, or in serving their interests or welfare in the practice of an art founded on it. Formerly theology, law and medicine were specifically known as the professions; but, as the applications of science and learning are extended to other departments of affairs, other vocations also receive the name. The word implies professed attainments in special knowledge, as distinguished from mere skill; . . . and an application of such knowledge to uses for others as a vocation, as distinguished from its pursuit for one's own purposes. In professions strictly so called, a preliminary examination as to qualifications is usually demanded by law or usage, and a license or other official authority founded thereon required."—Century Dictionary.

(5) This comment applies to proprietary schools as well as to the best, for even in proprietary schools, in spite of the mercenary policy of administration, the student invariably obtains, or should obtain, much "more than his money's worth," whatever the size of the fees he pays.

for the promotion of the public welfare. Consequently the professional man does not, like the tradesman, expect to obtain, or exact, in money, full equivalent of what his service is worth to the one who benefits from that service. The professional man does not seek to obtain, and never permits himself to accept, in return, a value that is greater than his service is worth to the one who received that service.

A professional man never knowingly profits from misjudgments or mistakes by those he serves—in his professional relations he never takes the tradesman's view that he is "not his brother's keeper" and that "business is business." The professional man aims, on the contrary, to give faithfully and generously of his professional service, as liberally as he himself has received from his profession's store of inherited knowledge—he aims to give much greater value to those who seek his service than that received by him, in return, in money or any value. The professional man is well satisfied and fully content, as a public servant, so to serve his day and generation as to merit and gradually to acquire a competence, i.e., an income sufficient reasonably to provide permanently (for himself and family) the necessities and conveniences of life without superfluity, a just and honorable recompense for a career devoted primarily to public service; he does not, and will not, degrade his professional purpose, activity, and efficiency, to the low, selfish level of "money grubbing." (6).

Charges for professional service, by the true professional man, do not "register the equilibrium between opposing purposes to obtain the maximum value for self," as prices do in trade. Professional charges are not merely fair charges—they are generously fair charges—because in fixing his charges, the professional man retains a modest and intimate comprehension of the inherent deficiency of his best service; he puts into his judgment of values the gentlemanly sympathy, for those he has the opportunity to serve, that is a part of his professional attitude; and he yields to his high purpose to give to, and serve, consciously and conscientiously, the public, through generous helpfulness to every individual it may be his duty or privilege to aid. If the professional man "makes money," his financial success is incidental to his primary purpose to serve the public.

The professional man rarely spares himself in the performance of his acknowledged and accepted duty to society. The professions are characterized by unselfishness—and the more altruistic its ser-

(6) "We have grown literally afraid to be poor. We despise any one who elects to be poor in order to simplify and save his inner life. We have lost the power of even imagining what the ancient idealization of poverty could have meant—the liberation from material attachments; the unbribed soul; the manlier indifference; the paying our way by what we are or do, and not by what we have; the right to fling away our life at any moment irresponsibly; the more athletic trim—in short, the moral fighting shape. It is certain that the present fear of poverty among the educated class is the worst moral disease from which our civilization suffers."—James.

vice, the higher a profession's standing in public estimation and respect. When it is conducted in accord with its greatest opportunities and responsibilities in public service, a profession affords, by common consent, a livelihood that represents one of the highest and noblest forms of public usefulness (7). The practice of the professions is a necessity in every civilized community. High degree of proficiency, and wide extension of effective service, in the professions improve the health and happiness of a nation; and, supported by material prosperity, afford a spiritual basis for a people's growth in intelligence and civilization.

Trade is occupation that may be successfully conducted with little or no training and is often a temporary pursuit. A profession cannot be successfully conducted without extensive preliminary preparation and is usually life-work. Tradesmen of a particular kind, in a given community, are rivals and usually are in each other's way as competitors. The members of a profession, in a given community, are colleagues and unite to co-operate in serving the community. (8).

The dominant note in trade is: obtain! The essence of a profession is: give! Trade is based on fairness in exchange. The professions express liberality in service. In trade, "honesty is the best policy." In a profession, generosity is the best purpose. Trade, at its best, is exchange of commodities representing equally desired values: equity. A profession, at its best, is performance of greatly needed service for a monetary value that is avowedly less desirable: generosity. (9).

Some tradesmen honor themselves by conducting their business on the higher plane of a profession. Very many professional men degrade themselves and their professions by rendering service on the lower plane of common, even dishonest, trade.

I have been regarding dentistry as a profession—a profession that is coequal, in usefulness, opportunity, and dignity, with the profession of any other branch of medicine, the great art of preventing and curing disease. I protest against any attitude, inside or outside of dental circles, that delays or prevents the development, acceptance, and operation, of the highest professional ideals

(7) "When we try to serve the world (or to understand it), we touch what is divine. We get our dignity, our courage, our joy in work because of the greatness of the far-off end always in sight, always attainable, never at any moment attained. Service is one of the ways by which a tiny insect like one of us can get a purchase on the whole universe. If we find the job where we can be of use, we are hitched to the star of the world, and move with it."—Cabot.

(8) "Trade knows only the ethics of success; profession is bound by lasting ties of sacred honor."—Faunce.

(9) The reader is reminded that the above remarks about the professional man, his service, and his charges therefor, do not apply to the tradesman disguised as a professional man. Dentists who sell themselves to dental supply-houses, or become trade-marks in dubious dental business, or help in any way to "skin the public" and exploit the dental profession, are professional hypocrites and tradesmen at heart, and deserve neither the honor nor the respect that the straightforward tradesman merits and always receives.

in dentistry. I am unwilling to admit that a tradesman engaged in the practice of dentistry (and there appear to be a number of clever tradesmen in such practice) is properly or suitably called a dentist, for dentistry is more than skillful practice of a mechanical art.—*Journal Allied Dental Societies.*

Easter Conference of the Toronto School Dental Staff

J. A. PRIESTMAN, D.D.S., TORONTO.
SECRETARY SCHOOL DENTAL STAFF.

THE Easter conference of the Toronto School Dental Staff was held in the Administration Building of the Board of Education on 2nd and 3rd of April, 1918. Very interesting papers on different branches of school dental service were read by members of the Staff, and addresses were delivered on educational and public welfare work by invited guests. Dr. J. A. Bothwell and the members of the Hospital Dental Staff were also present.

The conference was presided over by Dr. Wallace Seccombe, Supervisor of School Dental Service, Department of Public Health, and the opening address was given by Dr. Chas. J. Hastings, Medical Officer of Health for Toronto. Dr. Hastings reviewed the work of the dental staff, and thanked them for their co-operation with the other services of the Department in safeguarding the health of the rising generation. Dr. Hastings also referred to the great role dental disease plays in general systemic troubles.

The Staff was greatly benefited by addresses on different phases of the question of "State Dentistry," by Dr. R. G. McLaughlin and Dr. F. J. Conboy, of Toronto. A paper on "Prevention of Malocclusion" was appreciated by all present. The subject was capably handled by Capt. J. C. Allan, C.A.D.C., a former member of the School Dental Staff. The first day's programme of the conference was brought to a close by Dr. J. A. Bothwell's discussion of "The Duties of a Dental Assistant in a School Clinic." This subject was presented in detail by Dr. Bothwell, and a general discussion followed.

The opening address for the second day of the conference was given by School Inspector Moshier, of Toronto. Inspector Moshier pointed out the educational value of school dentistry from the teacher's viewpoint, and thanked the dental staff for their co-operation in raising the standard of efficiency of the Toronto school children.

"Surgical Aspects of School Dentistry," was the subject of a very instructive paper read by Dr. W. W. Macdonald. Dr. L. E.

Tanner's paper on "Preventive Dentistry in Schools," brought out many new points and reviewed the work done by that branch of the school staff.

The following resolution was moved by Dr. E. V. Hart, seconded by Dr. M. Rutherford, and passed unanimously: "That an effort should be made to organize, as a section of the Ontario Educational Association, a section to be known as the School Health Section, to embrace the activities of the school physician, dentist and nurse, and further active co-operation in health problems between the members of the School and Health Staffs."

Drs. Seccombe and Conboy were asked to present the above resolution to the Ontario Educational Association and endeavor to arrange for such a section in the O.E.A.

Those who attended the conference were: Drs. C. J. Hastings, Wallace Seccombe, J. A. Bothwell, R. G. McLaughlin, F. J. Conboy, Capt. J. C. Allan, Inspector Moshier, Drs. Gordon, Gardiner, Jones, Hart, Tanner, Priestman, Atkinson, Macdonald, Schnur, Richardson, Reid, Halloran, Hoffman, Murphy, Bell, Walker, Ballantyne, Singleton and Rutherford.

Prevention of Malocclusion*

JAMES C. ALLAN, D.D.S.,
CAPTAIN CANADIAN ARMY DENTAL CORPS.

THAT prevention is preferable to cure is conceded by all practitioners possessing the true professional spirit. Then it would seem the duty of the dental profession to prevent malocclusion of the rising generation, in so far as it is within its power to do so. We will consider how this can be done.

The prevention of malocclusion in private dental practice (let alone in public schools), is hard to carry out unless you have patients who are fortunate enough to have interested and far-sighted parents. You certainly require the co-operation of both parent and child, if the instructions you give are to be carried out by the patient when absent from the office.

There are many cases of malocclusion that cannot be prevented. These conditions are generally hereditary, and require to have appliances adjusted when the patient is very young. A good example of such a case is that of the receding chin, where the child is a normal breather, but yet there is an under-development of the mandible, similar to a condition possessed by either the mother or the father.

* Read before the Easter Conference of the Toronto School Dental Staff, April 2nd and 3rd, 1918, and published by courtesy of Lieut.-Col. Thompson, A.D.D.S., M.D., No. 2, C.A.D.C.

Preventing a mal-relation of the teeth in such a case, is out of the question. Nothing but appliances will give you a result. The place to get in your preventive measures is by watching the development and condition of the deciduous arches and keeping them intact, so that as the mandible grows, the growth takes place in a normal way under normal conditions.

The principal causes of malocclusion may be stated as follows:

- (a) Abnormal tissues in the oral cavity and adjoining parts.
- (b) Loss of tooth material.
- (c) Faulty dental restorations.
- (d) Disuse.
- (e) Habits.

Probably the last two mentioned are the greatest enemies to the normal development of the dental arches.

To have a normal development we must have the teeth carry out their function in a vigorous way, and any lack or disuse of the teeth in mastication, makes itself evident in the development of the occlusion and the condition of the surrounding tissues. For generations our foods have been prepared in such a way that they need very little masticating, to make them "feel" as if they were ready to be received by the stomach. The result of this limited use of the muscles of mastication is lack of stimulation of the tissues surrounding the teeth, lack of flow of blood and a healthy pink condition of the gums, and lack of normal resorption of the roots of the deciduous teeth.

In cases where we have found this lack of use of the teeth, Dr. Young and myself have been giving our little patients gum, especially prepared by the Kerr Dental Co., called Exodent. It is very tough, like tamarack gum, and causes the muscles of mastication to get tired and sore after chewing it for a while. It also cleanses the teeth and automatically massages the gums, which all tend to stimulate conditions which are natural and normal.

Where some of the deciduous teeth are lost prematurely, a normal condition does not exist. Therefore, a normal development and growth cannot follow unless nature is assisted by the orthodontist, who installs appliances to maintain the spaces so that there will be ample room for the permanent teeth when they erupt. This, of course, is in young patients where the permanent teeth are not ready to erupt until some considerable period after the loss of their predecessors.

The bad habits that are acquired by these little tots will stay with them for a long time, unless they are corrected. They acquire the habit of moving the mandible to the position that is most comfortable for them, and when all the teeth are present, and in good condition, that position is normal occlusion. But if a large part of the second

deciduous molar, for instance, is lost by caries and restored by a filling, that does not restore the anatomical conditions, but is just a round lump in the tooth, proper occlusion is interfered with. This is liable to be the starting point for a habit that will cause that child to swing the jaw to a more comfortable position in order to avoid the inconvenience of striking the filling, and thus cultivate a habit that will be detrimental to the position of the permanent teeth when they erupt. Thus we cannot put too much stress on the careful filling of teeth, even the deciduous teeth, as a vital point in the preventing of malocclusion and a normal development of the surrounding tissues.

There are numerous other habits that a child may unconsciously acquire, such as:

(a) Mouth breathing.

(b) Thumb sucking.

(c) Lip biting.

(d) Pressing on the lingual surfaces of the anterior teeth with the tongue.

(e) Keeping the tongue between the upper and lower incisors when at ease, and causing an open bite in this region.

In the last named case, they don't bite their tongue, but just keep their teeth apart. This allows the posterior teeth to elongate, and thus establish an open bite in the anterior region, when the teeth are occluding in the molar region. These cases are very hard to treat, and you can readily appreciate what could be prevented by breaking a child of this habit as early as possible.

Mouth-breathing is usually due to some obstruction in the nose or throat, and can be greatly benefited by having these obstructions removed. But if the teeth are in a malrelation, the removal of adenoids and tonsils does not correct or tend to correct it. Appliances are absolutely necessary. If discovered at the beginning of the habit, you can see what a great good has been rendered to the patient by prevention, a service better than any orthodontist could possibly give.

Lip-biting is a habit that can easily be detected by observation, and a child broken of it, if correction is started early enough. The lower lip generally enlarges from this habit, and the upper anterior teeth are moved labially and are usually spaced. In the practice of Orthodontia, to prevent or correct this habit, we band, say the two upper central incisors, and solder a couple of little sharp spurs, so that when the patient tries to bite the lip, these spurs stick his lip, and he soon learns that it is to his comfort not to do so. Another way to prevent this habit is to paint the lower lip with tincture of Quassia. It is anything but pleasant tasting, and serves as a reminder about the habit.

Thumb-sucking is generally practised at night. The child will go to sleep sucking its thumb. In the breaking of a habit of this kind the parents can be of valuable assistance. This habit has been combated with mittens of various kinds, but a very successful means to overcome it is to bandage the arms around the elbows so that the child cannot bend the arm without pain or discomfort. You will find this helps out wonderfully. The band with a sharp spur can be used in these cases also.

Where this habit has been practised for a number of years, during the period of development, a depression will be found in the hard palate, due to the pressure of the end of the thumb on the central and lateral teeth, on the side corresponding to which thumb the patient uses, and the teeth will be more prominent than the other central and lateral. By looking for these indications you can tell the mother which thumb the child sucks as soon as you see the patient.

Just how far habits are responsible for the various malrelations of the teeth in childhood is very difficult to say, but it is a well-recognized possibility that many of our most perplexing cases of malocclusion will be found, eventually, to be caused by some habit, which may have been very hard to detect.

Another important cause of malocclusion is the too early extraction or too long retention of the deciduous teeth. This is where you, as school officers, will be able to do more in a preventive way than in any other. Experience has shown us that it is not unusual to find certain teeth congenitally absent. In cases such as these the radiograph is our best friend for preventing a malocclusion. On the contrary we often find supernumerary teeth. These should be removed just as soon as they are noticed, as they are just a mechanical means of throwing out nature's attempt to establish normal occlusion, and they have no place in the dental arch.

To get back to the old story, I would like to say that it is of the utmost importance to the prevention of malocclusion to restore a part of a tooth, lost through caries, with a restoration as nearly resembling the lost portion as the operator is able to produce. Normal occlusion is the basis of every dental operation, even to the proper filling of root canals, and if these portions are not restored anatomically, instead of preventing a malocclusion, you are cultivating one. To my mind the making of a natural restoration is most important. Sloping fillings establish malrelations of the opposing teeth, and are often responsible for the decay of an approximating tooth.

It is the duty of the dentist to make a natural restoration. In making restorations of tooth tissue further prevention of caries is only second in importance, and is incidental in the proper preparation of such a filling. When a man makes no preparation for a restoration, and only removes the decay from the hole in the tooth and fills it with amalgam or gold, the tooth may be saved to a certain

extent, but the means whereby it performs its function, is not restored, and its greatest efficiency still remains lost.

In summing it all up, proper function is the greatest factor toward the development of normal occlusion, providing there are no bad habits, and the child's teeth are taken care of by a competent dentist.

The erupting tooth follows the line of least resistance and is easily guided when erupting. The great guides, under normal conditions, are the incline planes, and if there is proper exercise and stimulation by mastication and no bad habits, and proper fillings, the incline planes of the various cusps will exert an influence that no orthodontist could compete with, in producing a normal occlusion.

Just before closing, I would like to say a few words, if I may, upon a branch of orthodontia which has been brought forward by Dr. Paul R. Stillman, of New York City. Dr. Stillman is a periodontist, and he has attributed a number of cases of pyorrhœa and recession of the gums, in adults, to faulty occlusion. These cases present spaces between the teeth where food is crowded in mastication, injuring the gum tissue and causing recession. Cases of deep over-bite often present a hypertrophied condition of the gums, and is much improved by reducing the over-bite. He calls these conditions "Traumatic Occlusion."

Dr. Young and myself have had the pleasure of working with Dr. Stillman on this subject, and although it is a new field, I may say the results attained so far are certainly encouraging and gratifying. By establishing a normal relation of the teeth we are taking the greatest prophylactic step that can be taken.

When these teeth are moved, the old bone is broken down by the osteoclasts and new bone is stimulated and formed around the teeth. As you all know, new tissue will combat a diseased condition better than the old diseased parts. This, along with stimulation of increased blood supply, and the teeth placed in a position whereby they can properly perform their function, makes the surrounding tissues pink and healthy. Of course, all deposits, etc., are removed by the periodontist before the orthodontic treatment is commenced.

I just wanted to mention that new work to you, gentlemen, as you may be interested in it, aside from your clinic work. As most of you know, I am indebted for most of my ideas along these lines to my good friend, Dr. J. Lowe Young, of New York City, with whom I have had the pleasure of being associated in the practice of Orthodontia for the past fourteen months.

Thank you for your attention.

MELTING MELLOTT'S METAL.—Use thin copper ladle (not iron); heat until the metal in ladle is half melted; remove from flame and rock the ladle until all is melted; pour immediately.—*W. E. Cummer, D.D.S., Per I. H. Ante.*

Surgical Aspects of School Dentistry*

WM. W. MACDONALD, D.D.S., TORONTO.

THE other day, while I was being served in a drug store, I noted a maxim that was hanging on the wall. It was, "A satisfied customer is our best advertisement." The more I looked at it the more it impressed itself upon me, and I rediscovered something that I had known for a long time, viz., that the child who steps out of the dental chair with a smile, and walks back assuringly to the little group waiting their turn to enter your sanctum, is the determining factor, psychologically, of the success or non-success of the morning's work. Therefore we always try to pick out a patient for the first case, who will be the least likely to start trouble,—because the converse is also true, that should the first patient return to that same little group with a troubled countenance and much weeping,—then is our trouble great for the rest of the morning, and our spirits are disquieted within us. There is one way of avoiding this, however, that is in having a separate exit for the unruly one. The Forsythe Dental Infirmary in Boston, has, we believe, recognized this necessity, and the patient entering the surgery has no contact with one who has gone before.

The reason for giving this paper is to bring the work of the Orde Street School Extraction Clinic, its methods and practices, to your attention, so that we may serve you better. We feel that only a few members of the Staff appreciate the service we are capable of rendering. I make that statement because most of our appointments are from about three dental centres,—the others we very seldom hear from. I don't believe that it is because these three have all the cases requiring anesthetics, but I do believe that having brought this matter before you, you will take advantage of the opportunity of having this work done for the patients who present themselves for treatment at your clinic, and who require surgical treatment with anesthetic.

Every person is familiar with the instructions as to which teeth should and which teeth should not be extracted, so that it will not be necessary to dwell on that except to say that most of the cases we handle are for the extraction of temporary teeth. Let us take a typical case and follow the series of treatments:

Mary Hill, aged 7½ years, presents for treatment at your clinic. The temporary molars are gone beyond redemption, and the temporary upper centrals and laterals are present, but the permanent ones are coming down into place. A six-year molar requires filling, and

* Read at the Easter Conference of the Toronto School Dental Staff, April 2nd and 3rd, 1918.

prophylaxis is badly needed. You take the yellow extraction card and fill it out fully, marking the teeth to be extracted. Do the prophylaxis, and possibly fill the molar, advise the child that these teeth are to be extracted, and that it will be done as painlessly as possible. If you want the child to return to continue treatment, say so on the card. If you do not want the child to return, say so on the card. Mary takes the card to the nurse at her school, and the nurse telephones us for an appointment. We inquire if the case is urgent, and Mary is given an appointment. On the morning of the appointment Mary and her mother present the card with all the spaces filled in. She is seated in the chair, and we examine the mouth thoroughly, taking note of the teeth marked to be extracted, of the condition of the gums, if there are enlarged tonsils or adenoids present, if any nasal obstruction, if clothing is tight at neck or waist. We decide that Mary shall have a general anesthetic.

Somnoform is used, and the apparatus is a product of the DeTrey Co. We keep this out of view of the patient until we are ready, then we console her with some comforting words, and apply the inhaler. The anesthetic lasts about a minute,—in most cases giving us time to extract eight or nine teeth. If necessary we can continue the anesthetic for another period. Usually the child will eject the blood from her mouth on being told to, and, after rinsing the mouth out with water until the hemorrhage has ceased, that patient is dismissed. The parent is asked to keep the child's mouth cleansed with a normal saline solution. Provided there is not a great deal of fear, Mary will go out very pleased at the fact that her teeth, which have been troubling her so, are to bother her no longer, for they now lie peacefully in that paper bag at the Orde Street Clinic.

Dr. Hastings made the remark yesterday morning that "Pain is one of man's best friends." It certainly is a friend that man is most concerned about, for in ninety-nine cases out of a hundred we are asked the question: "Is it going to hurt?" just before we start operating. And you men of this Staff want to know if the patients you send to us are going to be hurt or not. I can answer that: given a child who has not been scared by overhearing some people propound about the teeth they had extracted, given a child who will assist us as much as possible by doing what we say, then a painless operation can be done.

When the extraction is not very extensive, and conditions permit, we use a local anesthetic,—a 1 per cent. solution of Anocain. The majority of our anesthetics are local. Even a very small child will consent to a local anesthetic being administered. The gum is swabbed with cotton, painted with iodine, and the needle inserted just the same as for an adult. At the time of inserting the needle, we try to attract the patient's attention to something else. We are particularly fortunate in having a collie dog not far from the window,

who has saved us much trouble by entertaining our patients. A nurse who understands children is of valuable assistance at this point. Our favorite expression used on little boys was that "Most fellows would cry at that, but you're too big a fellow to do that."

Do we ever have trouble from our anesthetics? Yes, we do. In administering Somnoform, occasionally we find a patient who will stop breathing. This is usually due to an obstruction in the nose or throat. We swab the mouth and back of throat out and exert pressure with the hands on the abdomen. This is usually sufficient, but in some rare cases further means are necessary, and we have to use artificial respiration. Fortunately the heart keeps on beating. During the last year we have given nearly five hundred patients somnoform,—in two cases we resorted to artificial means of respiration; in probably twelve cases, the first pressure on the abdomen started them off again. Therefore, we state that Somnoform is one of the safest of anesthetics. It is the ideal anesthetic for children.

We have had very little trouble from the use of Anocain. Occasionally girls about fourteen years of age will feel a little faint, but quickly recover on being placed on a lounge and given some warm milk. It is very seldom necessary to bring the child back to the clinic again, for we nearly always are able to complete the case before dismissing it.

Now, Mr. Chairman, ladies and gentlemen, in a subject as broad as this we are apt to be too long-winded. There are most likely many factors which I have omitted to mention or have not made very clear. I should be pleased to answer, if I can, any questions.

Thank you.

DISCUSSION.

DR. REID: How do you disinfect the rubber bag and cushion?

DR. MACDONALD: The rubber parts are placed in a 10 per cent. solution of Lysol in a large glass jar, and allowed to remain for twenty minutes.

DR. SECCOMBE: Tell those present how you prepare the local anesthetic solution.

DR. MACDONALD: Fresh for each patient in a graduated tube.

DR. RUTHERFORD: What heart stimulants do you use?

Have you ever used Ethyl Chloride spray for local anesthesia?
Have you ever applied Phenol to the part where the needle is to be inserted?

DR. MACDONALD: 1. We have had no occasion to use heart stimulants. We have Strychnine on hand, also Amyl-Nitrate.

2. Yes, but our apparatus was not of the best, and we discontinued its use.

3. Have never applied Phenol, but blanched the gum with digital pressure.

DR. HOFFMAN: Why use mouth opener in preference to mouth prop?

DR. MACDONALD: We found the mouth prop very seldom in position when we were ready to operate. The mouth opener does not annoy, is not in our road, and is all ready when needed.

DR. RUTHERFORD: What advantage has Iodine over Alcohol?

DR. MACDONALD: Have never used Alcohol.

Preventive Phases of School Dentistry*

E. L. TANNER, D.D.S., TORONTO.

EDUCATION plays a most important part in Preventive Dentistry. The education of a child cannot begin too soon. From the time that the first teeth erupt, the mother should see to it that they are cleansed regularly and the habit thus formed will become "a part of the child." I believe that mothers are more careful of their children's teeth up to the ages of two to three years; then, for some reason, (perhaps because the child objects and many times becomes unruly, or other little ones demand the mother's attention), the teeth are badly neglected.

The school nurse plays a very important part in Preventive Dentistry, even among the children of pre-school age, through the instruction given to the older girls in the little mother's classes. You all know that in these classes there is a baby doll. The girls are taught how to care for the little ones and how to care for the oral cavity, and, when the teeth come, how to keep them clean. This not only teaches the girl, but in a great many instances she will go home, and, full of enthusiasm, will tell her mother what she has learned, and Preventive Dentistry is certainly helped. The nurse also visits the home and gives help and advice when necessary.

I would like to mention here the Mothers' Meetings, which have been conducted by Dr. Seccombe, and at which the mothers have been instructed in the ways and means of preventing dental decay. Some seed falls upon good ground, and some, of course, upon stony ground and soon to be forgotten. The warning about too many sweets will often bring a smile to the face of a mother and cause her to remark, "The poor child." I am sure that the value of these meetings cannot be overestimated, and the great majority of mothers appreciate them greatly.

When the child is sent to school, oral cleanliness, the cause of decay

* Read before the Easter Conference of the Toronto School Dental Staff, April 2nd and 3rd, 1918.

and the results of decay, should be made so plain that the child feels the necessity for preventing such results. Every child wishes to know the why and the wherefore of things, consequently it is necessary to tell them in very simple language why the teeth require such care.

But the whole responsibility of Preventive Dentistry cannot be put on the child. That would be absurd. There must be a whole host to remind the child of his duty. As a rule a child is glad to try and please you and will conscientiously promise to do your bidding, but he has so much on his mind, so many people to please, (including himself) that your request in regard to his teeth is often forgotten. Hence the necessity for the co-operation of mother, teacher, nurse and dentist. Any one of these can undermine the work of the others, but with the co-operation of all, the preventive side of dentistry can, to a great extent, be accomplished.

When the dentist has the help of the right kind of mother his work is almost assured. Just to illustrate this: I have in my mind a family where there are two children. Until these children were eight years of age they did not know the taste of candy. Rich food, cakes, pastry, etc. were never given them. Now, they may have a little good chocolate after a meal, but never in large quantities. I have heard them ask, "May I have a crumb of cake, Daddy?" and as a great favor it would be given to them. They are pictures of perfect health, have perfect teeth and happy as children should be. I believe the day will come when confectioners will not be allowed to sell to children indiscriminately. This would be a great preventive measure.

Now without the mother's aid, we are somewhat handicapped, but we are thankful to have the nurse to fall back upon, and with her persistent efforts wonderful results can be attained. If she has the proper vision of the preventive side of dentistry, her opportunity for service is very great. What she can impress upon the child mind about sweets, proper foods, health and disease, mastication and prophylaxis, is unlimited. Then again, the nurse is constantly reminding the child to use the tooth brush regularly.

Now a word about the teacher. My experience has been that the dentist can judge in a very short time, by the condition of the children's teeth, whether the teacher of a certain room is interested in the children's teeth or not. The teacher has a great influence, and if she uses it properly, it means a great deal. Among other things she can so often appeal to the pride of a child, impressing the fact that clean teeth are a mark of refinement. Some teachers encourage the children to clean their teeth by giving marks. When a certain number of marks have been obtained, stars are given. This has proved to be a great help.

The School Dentist, of course, performs a very great work. To be

successful in school work he must have the confidence and good feeling of teachers and nurses, and if he has these his work will be pleasant and harmonious in every school. If after the preventive measures that I have spoken of, there is dental decay, operative procedures are necessary. I really think this is the most difficult work of the school staff. Children from the kindergarten, mere babies, and from the primary classes, are as a rule shy and so terrified of pain that the dentist must be tactful, truthful, possess unbounded patience, and win the trust of these little tots, after which the corrections may be made with very little trouble. Of course with older children the work is not so difficult.

The conclusion of the whole matter is that the dentist must be conscientious, and in his work of Preventive Dentistry must realize that not only for the child of to-day, and the men and women of this generation, is he working, but for the greater good that will result to our nation in the generations to come.

DISCUSSION.

Dr. Hart agreed that the co-operation of mother, nurse and teacher was essential, and the mother in particular must be in sympathy with the work.

Dr. Seccombe spoke of the two branches of the school dental work. The men doing prophylactic and preventive work and those doing general operative work. He hoped that next year there would be more dentists on the School Staff, and that more time would be devoted to this particular branch of the work.

Dr. Richardson asked how many children could be examined in a morning by a dentist, giving at the same time needed prophylactic service. Dr. Tanner replied that this of course depended upon the condition of the teeth. A great many of these children require and receive prophylaxis, and some teeth are so badly stained that a great deal of time must be spent working upon them. Then again the amount of help given by the nurse in attendance has a great deal to do with the number of children examined. Sometimes twenty-five may be handled in a morning, and sometimes as many as fifty.

Choose Your Food Wisely

STUDY these five food groups—Every food you eat may be put into one of these groups. Each group serves a special purpose in nourishing your body. You should choose some food from each group daily.

1. Vegetables and fruits.
2. Milk, eggs, fish, meat, cheese, beans, peas, peanuts.
3. Cereals—Corn meal, oatmeal, rice, bread, etc.

4. Sugar, sirups, jelly, honey, etc.

5. Fats—Butter, margarine, cottonseed oil, olive oil, drippings, suet.

You can exchange one food for another in the same group. For example, oatmeal may be used instead of wheat, and eggs, or sometimes beans, instead of meat; but oatmeal can not be used instead of milk. Use both oatmeal and milk.

You need some food from each group every day—Don't skip any.

HERE ARE THE REASONS WHY YOU NEED THE FIVE GROUPS.

Fruits and vegetables furnish some of the material from which the body is made and keep its many parts working smoothly. They help prevent constipation which gives you headaches and makes you stupid. The kinds you choose depend upon the season, but remember that the cheaper ones are often as valuable as the more expensive.

Milk, eggs, fish, meat, peas, beans.—These help build up the growing body and renew used-up parts. That is their main business. Dried peas and beans make good dishes to use in place of meat part of the time, but don't leave out the other foods entirely. Milk is the most important. Buy at least a pint a day for every member of your family. No other food can take its place for children. Save on meat if you must, but don't skimp on milk.

Cereals—Bread and breakfast foods. These foods act as fuel to let you do your work, much as the gasoline burning in an automobile engine makes the car go. This you can think of as their chief business. And they are usually your cheapest fuel. Besides, they give your body some building material.

Don't think that wheat bread is the only kind of cereal food. The Government asks us to save wheat to send abroad to our soldiers and the allies. Let the North try the Southern corn bread and the South the oatmeal of the North. Half the fun of cooking is in trying new things. An oatmeal pudding is delicious. See Leaflet No. 6 for the recipe.

Sugar and Sirups are fuel, too, and they give flavor to other foods. They are valuable food, but many people eat more of them than they need. Sweet fruits, of course, contain much sugar and are better for the children than candy.

Fat is fuel—Some is needed especially by hard-working people. Remember that expensive fats are no better fuel than cheap ones. Use drippings. Don't let your butcher keep the trimmings from your meat. They belong to you. Children need some butter fat. Give it to them in plenty of whole milk or in butter. Remember the five groups.—*Bulletin, U. S. Department of Agriculture.*

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SILICATE CEMENTS.

WE have all learned by experience that no matter how good a cement may be, it will fall far short of our expectations, unless it is manipulated according to instructions. Silicate cements are in common use as a dental filling material, yet it would be safe to say that only a few operators obtain the maximum efficiency from them. The failure of silicates is due to the lack of interest displayed in the working properties of this class of cements. One makes a mix of a silicate or porcelain cement, inserts it in a cavity under conditions that might be expected for a temporary cement and then condemns all and sundry because the filling fails. This is not as it should be. The experience of careful and painstaking operators has shown that excellent results may be obtained if ordinary caution is observed whilst manipulating the silicates. Instructive essays on this subject have appeared in many of our journals, and from these much of value may be gleaned. One of the best papers bearing on the manipulation of silicates was read before the National Dental Association at its twentieth annual session, held at Louisville, Ky., July, 1916, by W. Clyde Davis, M.D., D.D.S., of Lincoln, Nebraska. A full report of this paper appears in the October, 1917, issue of "The Pacific Dental Gazette." No more profitable time could be spent than in the careful study of Dr. Davis' paper, and also in a review of the discussion which followed its presentation.

Although many writers have taken exception to the name, "silicate cements," as applied to this form of filling material, there appears to be no good reason for a change. Reference to Webster's Unabridged Dictionary, furnishes us with the following definitions:—

Silicate "is a salt composed of silicic acid and a base." We make our fillings from silicates which are brought about by a process of silicatization.

Silicatization "is the process of combining with silica, so as to change to a silicate." This is a chemical process—a synthetic process.

Cement, when used as a noun, is "any substance used for making bodies adhere together."

Little objection can be taken to the use of such names as "porcelain" or "enamel." Porcelain is "a fine translucent kind of earthenware," named after the shell.

"Porcellana," "either on account of its smoothness and whiteness, or because it was believed to be made from it."

Enamel, "a substance of the nature of glass, but more fusible and nearly opaque—with a variety of colors; also other materials used for giving a highly polished ornamental surface."

With these definitions before us we can raise little objection to the common trade names given this cement; indeed, we are impressed with their suitability. Now for a consideration of the method of preparing and inserting the material. First, the cavity preparation. This is quite similar to that for an amalgam filling. Access is the same as for any plastic filling. The contact point is just as essential, but owing to the nature of the filling material, is hard to maintain. The interproximal wear is greater than it would be with a metallic filling material. "The convexity of the filling's surface should be the segment of a larger circle than the metal filling. Proper separation is essential."

The same considerations of outline form that apply to any other filling material are applicable to silicate cements. Cavity margins must be extended until all surface decay has been included. Owing to the fact that silicates are not conspicuous, the cavity margins may be extended freely, especially on flat and labial and buccal surfaces. "When fissures and silicate grooves are encountered, they should always be included in the outline, as a leaky filling will result at the triangular space formed where the silicate grooves meet the filling."

The outstanding difficulty in the use of silicates has been the tendency of the filling edges to break away and so expose the mass of the filling to disintegration. "It is, therefore, necessary," says Dr. Davis, "to lay the cavity outline in areas subject to as little stress as possible. In locations subject to great liability to stress, it is necessary to extend the outline until full length enamel rods, supported by sound dentine, have been reached and then beyond that to a location not subject to the travel of the cusps of opposing teeth in the process of articulation. It is not necessary to pay much attention to the development grooves, for when these grooves are normally formed they are fully as strong as the materials in hand. It is most important that all enamel eminences be avoided, as the material is quite friable and offers very little support to the cavo-surface angle."

Silicate cements have practically no adhesive qualities, consequently, as with amalgam, provision must be made against the tipping strain. To do this we must prepare flat walls except the axial, flat seats of generous proportions and definite angles.

We are told that all softened dentine, the decalcified portion of tooth substance, is always saturated with the acid of decay (lactic acid), and that crystallizing silicate cement will absorb this acid. The result is a filling material of weakened structure. In view of these facts it is absolutely necessary that all softened dentine be removed from the cavity before the filling is inserted.

To omit beveling of the cavity margins seems to be good practice when preparing for silicates. A beveled margin causes weakness in that portion of the filling and this should be avoided.

In order to prevent any absorption of either acid or moisture from the cavity walls, it is best, in addition to the usual toilet preparations, to varnish the dentine walls. This also prevents the dry dentine walls from absorbing too freely the fluid parts of the filling material.

The rubber dam should be applied after a partial outline form has been obtained, and the color or combination of colors selected. It is extremely difficult to select suitable colors after the tooth has been isolated.

Now comes the operation, of prime importance, i.e., "Making the Filling," and we shall have Dr. Davis' report of his method. "When cavity preparation is completed, the proper material and instruments for making the filling should be placed in a handy position. Absolute cleanliness is imperative, particularly during the process of mixing, as otherwise the filling when completed will not be chemically pure. The mixing slab should always be kept scrupulously clean; should not have a scratched surface, and should be without color. This last point is to avoid any effect color would have in judging the shade desired. A good slab is produced by taking a large mouthed bottle and filling it with cold water, or even ice water, in order that the material may be held at a low temperature. Before using a thick glass slab, chill to a temperature of 60 degrees or a little below. The temperature feature in this manipulation is of importance. With nearly all of the processes in the filling of teeth wherein the dentist depends upon subsequent chemical action for a final result, chemical action should be either retarded or held in check during the entire process of manipulation, which is easily accomplished by a low temperature mix. "The process of setting," as it is called, is held in check until the material is finally in place, and further disturbance unnecessary. As soon as the filling has been placed in the tooth, the warmth of the body is sufficient to hasten the chemical action and better results will be secured. With most of the silicate fillings, the body temperature is sufficient; with others the best results can only be obtained by keeping the filling for a short time bathed in melted paraffin. The mixing slab should be at as low a temperature as possible, and not produce discomfort to the patient. A temperature of 60 degrees seems to be as low as can be borne by the patient when placing a filling in a vital tooth.

It is, therefore, quite practical to use a bottle slab, wherein the thermometer reaches 55 to 60 degrees, as no doubt the temperature of the filling is about 68 degrees when placed in the tooth. It is quite possible to use a bottle that contains iced water when the filling is to be placed in a non-vital tooth. At such times when the atmosphere is close to the dew point, as is evidenced by the condensation on the fountain cuspidor, there will be trouble about the formation of moisture on the cold bottle. When this is only slight, it does not seem to damage the filling. However, when the condensation is sufficient to be noticed or is excessive, the dentist has either to content himself with manipulation at a higher temperature or postpone the operation to a time when the atmosphere is above the dew point. The spatula must be of some material which will give off none of its substance during the process of mixing. For this reason the agate is the best and most popular. Begin the mixing only when the cavity is prepared and dried, and the filling instruments are laid out and ready for immediate use. While there is no great haste as long as the material is on the cold slab, there is left but a few seconds to make the filling after the material has been removed from the slab, on account of the rising temperature hastening chemical action."

We are all familiar with the methods of mixing cements, but it will not be amiss to suggest a general scheme for handling silicates. First, place some of the powder at one end of the glass slab. With the dropper place some liquid near and to the left of the powder. Both bottles should be re-stoppered in order to prevent contamination of the contents. Evaporation of the liquid upsets its composition, hence the mixing process of liquid and cement should begin at once. It is best to start out with a little more of both powder and liquid than is to be used, so as that no time will be lost in going to the containers for more materials. Begin by drawing into the liquid about one-half of the total amount of powder required for the filling. Mix with a rotating motion, holding spatula flat to the slab. When a mix of uniform consistency is obtained, scrape all of the mass off the slab with about three strokes. Take about one-third of the mix each time and so secure uniformity of the mass. Here is Dr. Davis' suggestion: "Do not scrape the spatula on the edge of the slab, but place it flat on the slab, holding it firmly and giving it a turn in the hand, which will practically clean it. Here more powder is added, a small portion at a time, and incorporated in the mass already mixed, by the method of crowding, which is done by rolling the spatula first against one side of the mass on the slab and then against the other. The addition of the powder by this crowding process is continued until the mass becomes of a consistency of putty, losing practically all of its adhesion and giving only slight evidence of a tendency

to follow the spatula from the slab. The proper consistency is reached when the mass has been mixed so stiff that the material just loses its gloss when being crowded by a rotating spatula, yet can be made to show a glossy surface when patted three or four blows with the spatula. In case the material looks very wet and glossy the mix is not yet stiff enough. If the three or four blows do not produce gloss, the mix is too heavy and must be entirely discarded."

There are some characteristics about mixing silicates that are worthy of observation. The lower the temperature at which the mix is made, the longer the time is for manipulation. The chemical action of the setting cement will be delayed if the mix is too thick. Although many materials may be made use of in spatulas for mixing silicates, the best results are obtained by the use of agate, ivory or tantalum. It is possible to use steel instruments for working silicates, provided they have been first highly polished. An unclean spatula or other instrument will cause a discoloration of the filling.

Dr. Davis recommends the filling of the cavity slightly to excess, the material being first crowded or wiped against every portion of the cavity walls from cavo-surface angle to cavo-surface angle. After the first quantity of material has been thus crowded into position, more of the cement is placed and patted or paddled to contour, continuing this process until the material is pushed over the margins. Patting of the filling aids in bringing back the gloss. To show the importance attached to the gloss, Dr. Davis says: "In case the gloss is not produced by the paddling, a homogeneous mass is not secured and the filling will lack proper color, will be of poor edge strength, and will make a very weak filling. If the gloss has been produced by the paddling or jarring of the material, it should be allowed to remain undisturbed until the process of setting has sufficiently taken place that the body of the filling will not be moved by any work upon its surface. After the filling exhibits the gloss the entire mass is coated with cocoa butter in order to exclude the air during the process of setting."

Three or four minutes is the time allowed for the filling to stand undisturbed. It is then ready for the finishing process. With the filling well submerged in cocoa butter, the excess of the filling is cut away nearly flush with the cavity outline. This is best done with a very thin-edged knife or chisel. "When the filling has been in position five minutes, very fine strips or discs coated with cocoa butter may be used to produce the desired gloss. The author prefers to leave the filling with file and knife finish and has abandoned the use of strips and discs as injurious. This completed filling should be scrubbed with cotton balls in order to remove all the cocoa butter possible, and the finished filling painted with a copal-ether varnish. No varnish of which alcohol is a part should be used. Evaporate to dryness with air, remove the rubber dam and test for occlusion

and articulation, provided the filling involves the occlusal or incisal surfaces. In case the filling is found to strike the opposing teeth, the excess should be ground off with fine carborundum wheels and again varnished."

Dr. Davis is of the opinion that it is only safe to use silicate in connection with angle restorations as a facing for metal fillings.

In connection with this question of facing metal fillings, Dr. Leonard, of Nashville, brings out a rather novel scheme. He says: "I have for a long time practised a method that I believe is the best solution I have ever seen of the restoration of the corners or the angles of teeth. In order to secure the full translucent effect of the silicates, after making my gold pattern for an inlay, I cut a window through it, cutting away as much of the inlay pattern as I safely can, and cutting away the entire enamel surface—that is, the part which is to replace the enamel, before casting the inlay; and then after that is made I enlarge this window as much as I am able to do and still get strength, then cut away as much of the 24-carat gold as I can, safely leaving the matrix. I mean on the incisal edge and along the mesial border, I cut a little groove as deep as I can, then reinforce that with an 18-carat solder, so as to get a thoroughly hard and strong filling that will not give when stress is put upon it. After cementing this inlay to place, and even while the cement is hardening, I place the silicate in position and finish it in the same way that I finish silicate where the silicate is used entirely. I find with this little window you obviate some of the difficulties of refraction that would otherwise give a dull appearance to that corner. In fact you have a tooth that if you have been careful in selecting colors and making a proper finish, displays no gold whatever, and yet has the full translucent effect of the normal tooth."

Dr. Davis has had the study of silicate cements under consideration for some time, and although he is not prepared just yet to make a tabulated report of his findings, he has the following general statements to offer:—

1. "The crushing strength of the silicates at twenty-eight days old is the greatest when the mix has been made at a temperature of 65 to 70 degrees F.

2. "That the amount of powder required for uniform consistency increases uniformly with each of the silicates as the temperature is lowered at which the mix is made. However, the quantity of powder line shows a slightly less rapid rise with the silicate cements.

3. "The rate of hardening varies considerably (with the four makes considered). However, with all there seems to be two distinct stages. The first stage is complete in from ten to fifteen minutes. With three even longer. With one make it continues for seven or eight days, when a decrease in the hardness sets in and continues for several days, we think due to the absorption of the oral fluids.

4. "The higher the temperature of the mix the more rapid the set-

ting, which is a well understood law in most chemical actions. The effect is much more noticeable in the rise from 50 to 75 degrees F. than it is from 75 to 100 degrees.

5. "As to the crushing strength. The four makes averaged, respectively, 256, 304, 262 and 254. The lowest crushing strength of an individual piece (cement) was 165 pounds. The highest was 345 pounds.

6. "As to the solubility in lactic acid. Generally speaking, the silicates are more soluble than tooth enamel and less soluble than dentine. The more powder manipulated in the mix, in proportion to the fluid, the less the solubility. The coarser the powder the more soluble as to primary etching, but the more shallow the effect with fixed strengths of acid solutions."

The Antiseptic "Flavine" (Acriflavine)

THE following has been officially communicated to the press by the Medical Research Committee:

The incomplete statements which have appeared from time to time in the press with regard to the antiseptic "Flavine" have necessarily led to some misapprehension of the situation by the public. The impression has been created that flavine is a substance of magical potency which can cure infected wounds, and that there has been an unnecessary delay in making supplies of it available for general use. It should be realized that no antiseptic, even a theoretically ideal antiseptic when that is obtained, can ever be more than an adjunct to skilled and thorough surgery. Flavine must be thought of accordingly in relation to the other new antiseptics which have been brought into successful use during the course of the war.

These fall into two main classes. One depends upon the use of chlorine compounds, as in the well-known "Eusol" introduced by Edinburgh workers, the similar "Dakin" solution and the more recent chloramine-T, introduced by Dr. Dakin from the Leeds laboratories. These have wide use in our armies, and are now known all over the world. The researches from which these arose, and which are still in progress, have all been supported from the beginning by government help through the Medical Research Committee. The second class, to which Flavine belongs, includes the elaborate compounds of which most are brilliantly colored and are used as dyes. From the first month of war special searches have been made among those on behalf of the Research Committee for unrecognized antiseptics of high value. Work at Haslar and at the London Hospital for the committee showed very early the value of malachite green, and this is giving valuable routine results in naval hospitals and elsewhere. When it was desired to investigate Flavine, which was a little-known, but patented, German dye, none was available in this country, and its manufacture requires highly skilled and laborious

work. The committee, however, caused a supply to be specially made in their biochemical department for investigation by Dr. Browning at the Bland-Sutton Institute. His remarks were first published in January, 1917. Three months previously, however, as a result of the first preliminary experiments, the committee arranged that preparation should be made for the difficult processes of commercial manufacture, and all the scientific information at their command was made freely available. As a result of this early action they were able to supplement their own supply in use for the first laboratory experiments and clinical trials by a large number of samples, which were sent in April to a selected group of consultant surgeons to the forces and other responsible surgeons for the purpose of securing official reports for the guidance of the Admiralty, the War Office and civilian institutions, whose action could not rest upon any single testimony or any small scale supply of the antiseptic. It is already clear that the special uses of Flavine for particular purposes have still to be carefully defined in relation to other antiseptics and to the operative methods of surgery, to which it can at best only be a valuable aid. While this concerted official study is in progress two or three firms are already preparing for commercial supply to the public. Under our patent law it has been necessary for them to procure license to manufacture from the Board of Trade. The hearing of applications for licenses has already taken place, and it is hoped that licenses to manufacture will very shortly be issued by the board. It is proposed that all the manufacturing firms shall use one and the same name for the substance, a condition which will restrain any firm from securing monopoly privileges by wide advertisement of a fancy name. The Medical Research Committee have proposed for important technical reasons that the substance shall be officially called "Acriflavine" in this country. This will avoid the German name "Trypaflavin," which is registered as a trade-mark, and prevent confusion with an existing vegetable dye already called "Flavine." No doubt the firms concerned will announce at the earliest moment their readiness to supply Acriflavine commercially.

During the progress of this work the committee have more recently put at Dr. Browning's disposal for study a compound closely allied to Acriflavine, which already appears to have identical or even superior properties, and if this be confirmed it will be easier to manufacture and cheaper for the public. This substance will be officially known as "Proflavine." An early scientific publication will be made on this subject.

The degree of government support which has been given from the beginning to the researches upon Acriflavine and other antiseptics has not always been made a matter of public knowledge. It is proper that financial and scientific help given officially should not diminish in any way the credit due to individual scientific workers or scientific institutions.—*Dental Record*.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TAKING A BITE FOR CROWN OR BRIDGE WORK.—One of the most difficult items in operative dentistry to contend with is the taking of a satisfactory bite, where the occlusions are extremely close. The following is submitted for its possible assistance to the operator in such cases: When the wax or compound bite is removed it often breaks in two pieces, making it difficult to get a perfect cast for the occluding surface or surfaces to be articulated to the crown or bridge to be constructed; or breaks when placed on the plaster model. A good, strong, sharp bite can be obtained in the following manner: Take a piece of the linen which comes on each side of a sheet of vulcanite rubber, cut it about the length and width of the bite to be taken, then place the bite wax above and below the piece of linen, and take the bite in the usual manner. The linen holds the bite together, and prevents a patient from biting clear through. Do not use paper, as paper become wet and tears.—H. F. Schlieffarth, *Dental Review*.

TO RE-CEMENT A LOOSE BRIDGE WITHOUT REMOVING.—Frequently the gold-cap end of a large bridge comes loose while the other part is still firm. Drill a hole in the crown with a No. 7 bur, wash out and dry. Having selected a rubber cup, such as is used for polishing teeth, the mandrel serving as a handle, fill the cup with slow-setting cement, and pulling the loose end of the bridge off as far as possible, press the cup over the hole in the crown, and slide the cup off the crown sidewise. Refill with cement and repeat until cement appears at the cervix. With the ball of the finger over the hole, press the bridge back to place. Fill the hole in the crown.—L. E. Custer, *Dental Summary*.

CURE FOR NAUSEATED PATIENTS.—For these troublesome nauseated patients that you can hardly take an impression and fit a plate for, camphor water as a mouth wash two or three days previous to the taking of the impression and fitting of the plate will help wonderfully. Then if you will get "rough" with them and say, "Cut that stuff; I haven't time to fool with you," they will get angry for the time and forget about being nauseated.—Y. E. Whitmore, *Little Rock, Ark., Dental Review*.

ANGLE HAND PIECE.—Take apart at joints, apply cup grease to gearings and avoid a flood of grime.—*J. H. Kolter, Wausau, Wis., Dental Review.*

ACETOZONE.—This substance, another of the series of "ideal anti-septics," is stated to have great advantages over our old and tried friend hydrogen dioxid, which, as most of us know, is unstable and momentary in its oxidizing power. Acetozone, chemically described as "benzoyl-acetyl-peroxid," and used in aqueous solution, is said to be stable, non-irritating, to have no inhibitive effect on phagocytosis; also to be very rapid in action and effective in septic wounds that have resisted all other forms of treatment.—*British Dental Journal.*

TO LESSEN PAIN.—After an extraction, where bone has been removed by burs or chisels, or where alveolar process is exposed, dry the surface and apply 95 per cent. phenol; then neutralize with alcohol. This will lessen the post-operative pain.—*R. E. Light, Dental Review.*

FEATHER-EDGES ON GOLD INLAYS.—To avoid "feather-edges" on cast gold inlays at the gingival border, insert the sprue in the wax pattern on the occlusal surface,—never on the contact point or approximal surface.—*Victor H. Fuqua, Dental Review.*

BELT SLIP.—Apply to it a wad of cotton saturated with sandarach varnish.—*J. H. Kolter, Wausau, Wis., Dental Review.*

CLEANING RUBBER FILES.—Pour chloroform over the file, which causes the imbedded rubber to curl up and loosen. Then take any kind of a stiff brush and remove the rubber, leaving a file that is as good as new.—*L. N. Roubert, Chicago, Ill., Dental Review.*

A HINT ABOUT RICHMOND CROWNS.—The blue or darkened appearance of a dental crown, made with a facing backed with gold (occasioned by the oxidization of the gold, caused by the heat required to solder the backing to the pins of the facing) may be obviated by backing the facing first with thin platinum plate then adding the gold plate over the platinum. The darkened appearance of the gum over the coping of the crown may be obviated by cutting away the labial side of the coping before setting the crown. The facing should be ground thin, where it comes in contact with the gum, and so adjusted that it will pass under the free margin of the gum.—*H. A. Cross, Chicago, Dental Review.*

GREEN STAIN.—Though "green stain" can be removed from teeth by means of a paste of powdered pumice and tincture of iodine, it is not so well known that a paste made of pumice and peroxide is equally efficacious.

GREEN STAIN.—Green stain, so often seen in children's teeth, disintegrates the tooth structure, and should be removed. This can quite easily be done with a rubber disc and pumice moistened with hydrogen dioxide.—*Dental Record.*

PRO BONO PUBLICO

This Department is edited by **Fred J. Conboy, D.D.S.**, and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Modern Dentistry—The Child

TO prevent caries, pyorrhea and apical abscesses, we must begin with the child. A child's deciduous or baby teeth should be as carefully watched as its permanent teeth. Small cavities should be filled immediately, and the child taken frequently to the dentist for examination. All of the baby teeth are in the proper position about the second year, and they should remain in place until resorbed and forced out by the permanent teeth. The six-year molar teeth which, as the name indicates, erupt at the sixth year, should be zealously guarded for caries, and promptly treated when found. Prophylaxis is very important, and should include not only the individual care of the mouth and teeth, but dental care by the family dentist, and dietary regulation when indicated.

The best diet for the prevention of caries consists of food which will properly stimulate the salivary glands. These foods are mostly acid, such as apples, pears, fresh vegetables and fruits of all kinds. Each meal should be started with an acid food and finished in the same manner. Bread, butter, cake, biscuit and chocolate are the articles which are the last consumed at night in the majority of cases,—articles which adhere strongly to the teeth, form the greatest amount of fermentation, and produce the least flow of saliva. Therefore, an apple, pear, or other fruit which will cleanse the teeth and stimulate the saliva should be eaten the last thing at night. Incidentally it might be said, that the present lack of sugar is, from a dental point of view, a blessing in disguise. We have been eating too much sugar.

The greatest cleansing agent that we have is the thorough chewing of the food; natural mastication and the moving of the jaw, cleanses the teeth better than any tooth brush or dentrifice ever invented. In uncivilized countries where food is very coarse, and consequently well chewed, caries is almost extinct. This chewing of food is of great value to our physical conditions, as the mastication of our food in the proper way has much to do with good digestion. Fletcherism is a prophylactic measure against dental caries. Pyorrhea may be prevented by constant dental attention, massage of the gums, the use of normal saline solution for a mouth wash, proper regulation of the diet, and the practice of general hygienic principles.

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, MAY, 1918

No. 5

EDITORIAL

The Importance of Deciduous Teeth

GIVE your little patient a fair deal. From the standpoint of the child the primary tooth is just as important as the secondary and should receive the same skilful treatment. The dentist who is not prepared to render the highest standard of service to the child, should frankly admit the fact and refer the patient to a confrere who has the time and disposition to care for children's teeth.

The use of the word *temporary* in relation to the deciduous teeth, is unfortunate as conveying to the lay mind an impression of lack of both permanence and importance. Few people, outside the ranks of the dental profession itself, realize that deciduous teeth normally functionate for periods of time ranging from six to ten years, and that these years are most important ones in the development and growth of the child. It is most important that during this period, every child shall secure maximum nourishment from its food. Thorough mastication and complete insalivation are the first essentials in the process of digestion. But how can a child with carious teeth, that cause severe pain upon the least pressure, thoroughly masticate its food? And without thorough mastication how can the teeth be kept clean and healthy?

The beneficent results of mastication (exercise) are also evident in an adequate blood supply to the teeth and investing tissues, thus predisposing to a normal healthy development of the dental arches and the correct position of the teeth therein. Furthermore, by the retention of the primary teeth until the secondary ones are ready to erupt, the possibility of mal-occlusion is greatly reduced.

The Oral Hygiene Committee of the Ontario Dental Society, recently discussed the chapter upon the teeth, contained in the Ontario Public School Physiology, and decided that it would be an advantage in teaching dental facts to school children to avoid the use of the word *temporary*, as applied to the teeth, and *treat the whole process of eruption as continuous and not divided into two distinct periods with two separate sets of teeth*.

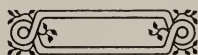
In this connection one of the members of the Committee suggested that the process of eruption might be presented, about as follows:—

“The first tooth to erupt is the central at about six months of age, and this is followed at intervals by other teeth, until at two years of age twenty teeth are in place:—ten in each jaw. These twenty teeth are each called upon to masticate the food for periods ranging from five to ten years. Between the ages of six and twelve these teeth are gradually replaced by others, but it should be borne in mind, that these first twenty teeth are most important and should remain in the mouth until replaced by nature.”

“Three additional molars erupt, upon each side, at the back of the mouth, as the jaws grow and develop to accommodate them. These molars do not replace other teeth, but erupt back of those already in place. The first of these molars usually enters the mouth at six years, the second at twelve years and the third about eighteen years or later. These three molars on each side, above and below, make an additional twelve teeth, so that the complete set numbers thirty-two—sixteen in the upper jaw and sixteen in the lower.”

A statement such as the above is a vast improvement over the usual method of instruction regarding the “Temporary” and “Permanent” teeth, and will do much to educate the child to an appreciation of the value and importance of all the teeth, whether they be subsequently replaced or not.

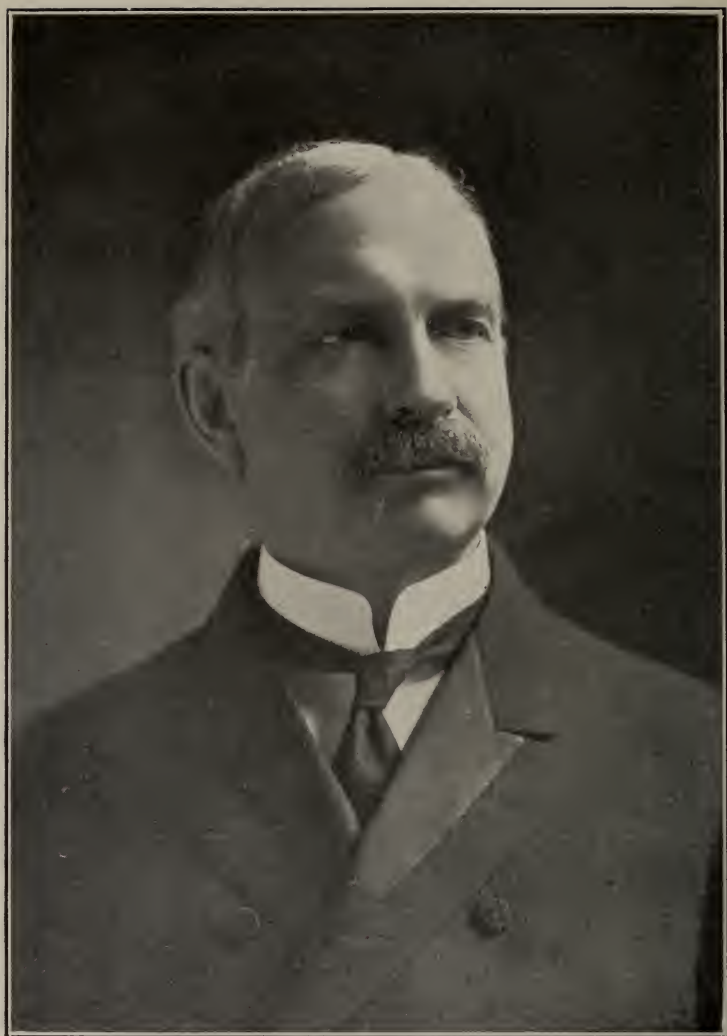
School instruction along these lines, however, should always be augmented by members of the profession treating all the teeth, both primary and secondary, with that degree of care and skill which their great importance demands.



*"All living organisms from microbe
to man perish in the excess of their
own waste products."*

This law works out as surely in
ETHICS as in BIOLOGY.





C. H. Johnson.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, JUNE, 1918

No. 6

Ontario Dental Society Convention President's Address

J. F. SIMPSON, D.D.S., TRENTON.

THE President in opening the Ontario Dental Society Convention read an interesting address, covering the more important historical events in the progress of the dental profession, and particularly the events of importance in the organization and development of the profession in the Province of Ontario. In this connection Dr. Simpson mentioned the names of the late Drs. W. B. Day, of Kingston; the late Dean J. B. Willmott, Dr. Luke Teskey, of Toronto, and Dr. N. Pearson.

Reference was made to the good work of the Dominion Dental Council, and a prediction made that the time was not far distant when some form of reciprocity in dental licenses would obtain among the different parts of the British Empire.

The President also urged that the proceedings of the Ontario Dental Society be published in book form and sent to each member so that the proceedings might be available to the members for future reference. The members of the Society were also urged to support the college museum and send to the Curator any specimens that would prove of interest and value.

The President paid a glowing tribute to the work of the Canadian Army Dental Corps, and referred to the many honors which had already been won by the members of the Corps, and to the high public appreciation of the dental service in the Canadian army.

Dr. Simpson closed his address by sincerely thanking the members of the Society for the honor they had conferred upon him in having elected him to preside over the destinies of the Society for the past year.

C. N. Johnson at the Ontario Dental Society Meeting

F. C. HUSBAND, D.D.S., TORONTO.

ONCE again has the Ontario Dental Society been favored, not only with the presence of our much beloved Dr. C. N. Johnson, but with the uplift which he always brings.

Dr. Johnson always discusses his theme as a thing of living reality with which he is in vital relation, and with which he wishes his hearers to become familiar.

When he discusses the interproximal space and contact point—that space between the teeth normally filled with gum tissue, pyramidal in form, arched bucco, or labio-lingually, with the apex just below that very narrow area known as the contact point where the teeth touch each other as two spheres would touch,—when he discusses these anatomical features, there is left with us the conviction that the maintenance or restoration of them is absolutely essential to the health and comfort of the mouth,—that every effort must be made to restore these parts to normal. If the teeth have fallen together through destruction of the contact point, they must be wedged apart, preferably by packing with gutta percha,—until the contacts of several teeth on either side of the space are tightened up,—then they must be built up with a restoration of gold foil or with an inlay, whose contact is tight enough to make the patient conscious of the tightness. If fibres then pass between these contacts, the bite must be examined to see whether an opposing cusp is not causing the teeth to be sprung apart. When packing in the gutta percha the gum must be pressed back evenly at the sides as well as in the centre, otherwise it will not come back and fill the interproximal space.

Again does Dr. Johnson remind us that cavities prepared for gold foil or inlays must have flat seats to avoid tipping, and in the case of inlays to facilitate cementing, gingival wall at right angles to axial wall, step at right angles to pulpal wall or to line of stress. He favors the use of stones for the main preparation, using burs and chisels to flatten surfaces and sharpen angles.

Wax for inlays must have a high melting point so that it can be handled at body temperature without distorting. It should be warmed in water and moulded so that it will reach the gingival margin before being forced to place. After carving and polishing, it is mounted with the sprue wire inserted at the contact point, and cleaned with acetone and a fine camel's hair brush before investing. Weighing water and investment carefully before mixing, and careful mixing and tapping to eliminate bubbles is essential. After allowing to set for twenty minutes, the investment should be slowly burned out, and the casting done in either hot or cold mold, 22K. gold with contact of 18K. solder being preferable to 24K. gold for the casting.

The difficulty in fitting M.O.D. inlays can be overcome by observing first, to place the sprue wire midway between the contact points and putting in supplementary wax sprues on each side, and second, to bevel the gingival margins.

The cementing of the inlay is facilitated by the use of a lead mallet with leather face and a strong plugger, and then getting the patient to bite with rubber between the occlusal surfaces. The cement should be removed before it gets hard, and the inlay finished with disks.

Grooving the cavo-surface of the inlay bucco-lingually and roughening the same surface of the cavity wall gives additional stability.

Dr. Johnson took up the question of the business management of an office with special reference to its ethics, the necessary competence and the professional aspect. He pointed out that we, as a profession, were dealing with matters of which the public are ignorant, and that therefore there was a moral obligation on the part of the operator, a higher moral obligation in dealing with persons than with things, as was the case in a trade,—that there was a happy medium between business sense and ethical consideration. In speaking of fees, he pointed out that there could be no set standard, either by the hour or by the operation. The efficiency of hours varies, and a combination of both methods.—*i.e.*, time and nature of the operation—resulted in the greatest fairness. Thus the operator could look his patient straight in the face and ask his fee. Ethics is the science of morals. In dentistry obey the golden rule. In dealing with human life and welfare you deal in a very different way than you do in business.

The service the dentist hands out to the public gives returns such as no other profession gives. He is a scientist, a diagnostician, an artist, a mechanic, and should be withal a perfect gentleman.

Recognized as we are by the Government should make us all feel our responsibility.

In the matter of collections, use tact, do not sue and forget bad debts. In dealing with investment, avoid the "Promoter." Do not speculate, but consult an investment specialist, as he would consult you in a matter of dentistry.

Above all invest first in a home and life insurance to protect it and your family.

The following are suggestions for investments:

First.—Buy good stocks outright and put them away.

Second.—Buy mortgages on real estate on property known to you, and recommended by your banker.

Third.—Buy bonds.

In closing his lecture Dr. Johnson rose to a height of eloquence referring to the great struggle we are engaged in, fighting the demon of brutality, terrorism and irresponsibility, and hoped to be spared to see the day when democracy in its highest inflection would stand victorious over every hurtful foe.

The Convention Banquet

W. C. SMITH, D.D.S., TORONTO.

ALWAYS an enjoyable feature of the Ontario Dental Convention program is the luncheon. On Wednesday, May the first nearly two hundred of the members gathered in the Central Y.M.C.A., where during luncheon good fellowship spent itself on topics ranging from "matrimonial investment to Home Rule for Ireland."

Chairman Simpson called upon Dr. H. W. Anderson to introduce the speaker of the occasion. This year we were favored in having Dr. McArthur, an Ontario "old boy," and his recalling for us of some of his life achievements (for he nears his eightieth year), in such a modest, gleeful delivery, at once made his hearers glad of another home boy's success as a world influence.

Upon graduating at Woodstock Baptist College in 1863, Dr. McArthur continued his studies in Rochester, N.Y., after which he became the pastor of Calvary Baptist Church of New York, corner 42nd St. and 5th Ave., which pulpit he occupied during his entire ministry of 42 years. Visitors in Dr. McArthur's American field readily saw evidences of an enduring work, and this local success, coupled with a characteristic world vision, brought him the appointment of President of the Baptist World Alliance, which position he at present holds. As such, he has visited almost every country, and his intimate knowledge of the Russian people inspired a recent President of the United States to offer him the American Ambassadorship to Russia.

The speaker chose to talk upon the timely subject of "The Causes of the Russian Revolution," tracing the growth of democracy in this autocratic empire.

Foreign influence has always had a dominating effect in Russian court circles, originating with the earliest establishment of a Russian Government under Scandinavian influence, and existing from the rule of Rurik, a Norseman of the ninth century, to 1613, when the present Romanoff family, also of Norse connection on the mother's side, was invited by the people to govern, being the earliest evidence of a democratic Russia in embryo.

The Baltic provinces of Russia, previous to the eighteenth century, were under Swedish control, but after several indecisive wars fell to the Russians, Sweden losing half of her empire. Peter the Great, bent on making Russia a nation of culture, then established a window for his vast empire to look to the West, in building St. Petersburg, though on a series of marshes. In this new capital, removed from its far Eastern territories, Swedish and German elements of the Baltic provinces are felt socially and politically even to the Czardom.

Of the eight Czars of Russia five have married German Princesses. Czar Alexander III. married a Danish Princess, his son Nicholas II., the now deposed Czar, almost wholly of German and Danish blood, is married to a German Princess, whose mother was daughter of Queen Victoria, he himself on his mother's side being a first cousin of King George—thus making the supreme factor in the future of Russia one of English-Danish-German culture.

But the incompetence of the Czar, as evidenced in his inefficient conduct of the Japanese war, was more noticeable in his lack of character, strength and ability in breaking promises to his people as soon as made, culminating in such uprisings as the "Bloody Sunday." Dark forces in the palace of Petrograd appear in 1906, when an ignorant and immoral monk of Siberia, called Rasputin, appears, exercising his power on the throne in expelling high officials and scheming with Germany. When shot in 1916, the sympathy of the Royal household was shown toward his treachery in marching behind his body and planning for a church over his grave.

But amidst the darkness of Russia a ferment of democracy has been working. A democratic organization of town meetings, known as the Mir, has been operating throughout the empire, promoting a democratic spirit, while in the counties a similar organization works, known as the Zemstvos. These two facts made possible the overthrow of autocracy a year ago. Evidence of such a working within the masses the speaker believes to augur well for a new nation.

The appreciation of the gathering for the eloquent and scholarly treatment of the subject was fittingly presented by Dr. Harold Clark and Dr. Ross Thomas.

'02-'03 Class Reunion

N. S. COYNE, D.D.S., TORONTO.

THE Annual Dinner of the Freshmen Class of '02-'03 of the Royal College of Dental Surgeons, was held at the Lambton Golf Club, during the Convention on Tuesday evening, April 30th. About twenty members of the class were in attendance, among whom was one of the "Boys" from the west, in the person of Dr. Frank Harwood, of Moosejaw, President of the Board of Directors of the Saskatchewan College of Dental Surgeons.

The guests of the evening were: Dean Webster, Dr. Walter Willmot, Dr. Ralph Hartley, of Chicago (late of Dresden, Germany), and brother of Dr. Charlie Hartley, an old member of the class, and Captain (Dr.) Park, once a prisoner of war in Germany.

After dinner a short programme of speeches and songs was indulged in. Dr. Bothwell occupied the chair in his usual capable manner.

Conventionalities were largely laid aside for the evening and "the boys" enjoyed a free and easy time, renewing friendships formed some sixteen years ago. Everybody was at his best, and a spirit of good fellowship seldom seen among men of any calling, pervaded the atmosphere.

The principal formal entertainment of the evening was an address by Captain Park on his experiences when a prisoner of war in Germany, and an address by Dr. Ralph Hartley, who practiced dentistry in Dresden, Germany, for some years.

The two addresses were listened to with intense interest, by every man present, and at the close of Dr. Hartley's address several of the boys asked a number of questions bearing on the civil and military conditions existing in Germany, which Dr. Hartley answered in a very illuminative manner.

A very pleasing feature of the programme, was a couple of solos by Dr. Frank Harwood, which were very much enjoyed by all present.

A few remarks were made also by Dean Webster, Dr. Walter Willmot and three or four members of the class.

The President then asked for nominations for officers for the coming year. The following being elected:

President—Dr. L. G. Thompson.

Secretary—Dr. Alex. R. Jordan.

Treasurer—Dr. Gerald Smith.

The gathering dispersed at midnight, everybody feeling that such occasions come only too rarely. A matter of regret was that at least three Toronto members of the class were absent because of serious illness in their homes.

All of the members expressed appreciation of the good work done by the officers in the arrangements made for the gathering, and the hope was freely expressed that other graduating classes would take advantage of future meetings of the Ontario Society and arrange for class reunions during the convention week.

Nerve Blocking in Dental Practice

REPORT OF DR. SMITH'S ADDRESS BEFORE THE O.D.S.
CONVENTION.

R. GORDON McLEAN, D.D.S., TORONTO.

DR. A. E. SMITH, of Chicago, gave two most instructive and interesting illustrated addresses on Nerve Blocking as applied in dental operations, before the Ontario Dental Association at its annual convention.

Unfortunately the benefit that should have been derived from his lectures was somewhat marred by the too limited time given Dr. Smith, and also the usual delay in starting. We are all waiting patiently for the executive whose nerve supply has not been blocked, and who will insist on meetings commencing as scheduled.

The greater part of the lecture time was spent in lantern slides and moving pictures, and one must see these to appreciate the almost unlimited work that must have been done by this expert and enthusiast to produce them. Dentists who have been using nerve blocking to a greater or less degree, must have undoubtedly received much assistance, but the writer is of the opinion that the technique necessary to produce this form of anesthesia requires personal instruction individually or in small classes, and the importance and value of conductive anesthesia would warrant either our colleges or Dental Societies in making such arrangements that would make it possible for men to get this sort of graduate training.

Dr. Smith expressed his view that the relief from pain in dental operations is nearly as important as the operation itself. That a dentist that does not avail himself of all safe methods of giving his patient this relief is not doing his full duty to his patient or to himself.

That nerve blocking is only one of several methods, and good judgment should be used in the selection of the one that will best suit the case..

The advantages of nerve blocking are: I. The operator is allowed ample time to do any dental operation without hurry, and consequently more thoroughly than with any other method.

II. The operator has the co-operation of the patient, and this is to the benefit of both.

III. It is possible to produce anaesthesia in infected parts without danger and without pain.

IV. Large areas may be anaesthetized so that several minor operations may be done at the same sitting.

That to obtain good results from nerve blocking the following are necessary:

I. Aseptic procedure.

II. Accurate knowledge of anatomy of parts involved.

III. Fresh anaesthetic solutions and good equipment.

IV. Knowledge of the technique necessary to place the solution.

That post operations, pain, and other disagreeable results may be caused by the following:

I. The use of non-sterile needles or solutions.

II. Injection into or through infected tissues.

III. By too rapid injection.

IV. By injecting into muscles, ligament, or periosteum.

V. By injury to the parts, either surgically or lack of asepsis during operation.

Silicate Cements*

THOMAS COWLING, D.D.S., TORONTO.

Professor of Metallurgy and Associate Professor of Chemistry, Royal College of Dental Surgeons of Ontario.

THE study of the chemical and physical properties of the silicates involves a thorough understanding of the chemistry of the oxy-phosphates. These are best reviewed under two heads, viz., the powder and the liquid.

The earliest attempts at producing a dental cement consisted of a powder—zinc oxide, and a liquid—phosphoric acid. This acid was in a more or less concentrated form. Experience in the use of these early cements soon showed that there was required, in addition to the zinc oxide, some other material in order that they might be worked with greater ease, and also result in a greater degree of permanency. This gave rise to the search for suitable modifiers—a search which has led up to the present-day organizations devoted to this special investigation. As a result of the interest taken in this subject, various substances have been introduced as modifiers. Among these may be mentioned magnesium oxide, bismuth oxide, etc. It was found that when bismuth was used with zinc oxide, that it tended to increase the density and imperviousness of the cement. It was also learned that magnesium had a marked effect upon the time required for the setting of the cement.

The study of the liquid content of the cement had for its object the introduction of modifiers in order to reduce the acidity of the liquid as well as to regulate the rate of setting of the cement. As a result of long and careful research there has been added to the phosphoric acid liquid, certain metallic oxides or hydroxides, such as those of calcium, strontium, zinc, aluminum and beryllium.

It is not easy to explain fully the reaction that takes place when the powder and liquid are mixed together. It may, however, be stated in general terms that the basic zinc oxide reacts with the acid liquid, producing zinc phosphate and water. Such an action is comparable to that which takes place when milk of magnesia (magnesium hydroxide) is used as a mouth wash in order to correct the condition of acid mouth. Here the neutralization of the free acid is brought about with the formation of magnesium salts and water. When we mix a dental cement, the zinc phosphate formed, combines with the water of the liquid to form crystalline hydrated zinc phosphate. [It is important that we observe that all cement liquids contain more or less water, hence if we leave the stoppers out of the liquid bottle there will be evaporation of the water content, and this will result in the weakening of the cement. It is also possible that the liquid may

* A report of Dr. Vogt's paper read before The Ontario Dental Society, Toronto, May, 1918.

absorb moisture from the atmosphere when conditions are favorable. This is equally detrimental to the strength of the cement.]

The oxy-phosphate of zinc cement was found to be too opaque and dead in appearance to warrant its use for aesthetic restorations, and an insistent demand was made for a translucent tooth-like filling material which could be inserted in a plastic state. It was also desired that the cement have a natural tooth-like appearance, combined with permanency of form. Because zinc oxide used by itself was not translucent, search had to be made for other materials to meet the requirements of the times, hence the introduction of silicate cements.

Naturally enough, having had experience with the various forms of zinc cements, it seemed reasonable that if a translucent basic substance could be combined with it, which, because of its basic properties, would react with an acidic liquid, then all difficulties would have been solved. Attention was first directed to the metallic oxides and hydroxides, but with the exception of calcium and aluminum, they were found undesirable as chief constituents—calcium oxide (quicklime) because of its caustic properties, and aluminum oxide because of its inactivity. Both of these oxides have also an opaqueness about equal to that of zinc oxide. It was found, however, that aluminum possessed some properties of such a desirable nature that its use was indicated, provided the unattractive qualities could be modified. Hence it was suggested that a combination of these two oxides, calcium and aluminum, be used.

The desired cement was one which would have the durability, appearance and attractiveness of porcelain, so the investigating chemists took up the study of this material, as it alone seemed to offer a possible solution of the problem in hand. Porcelain is made by fusing together silica, kaolin and feldspar. Now kaolin and feldspar are complex aluminum silicates containing more or less potash, aluminum being next to silica in percentage. It was thought then, that the desired dental cement might be secured by combining, if possible, calcium with the porcelain constituents in such a way that they would react with the liquid. Prolonged study of this problem resulted favorably, for it was found that such a reaction was possible, provided a strongly basic melt was made, that is, one in which the proportion of basic oxides or their equivalents were higher than that of silica, an acidic oxide.

As with the zinc oxides, so with the silicates; their introduction was soon followed by the use of modifiers, as a result the present-day silicates may be said to include the oxides of calcium, aluminum, beryllium, strontium, sodium and potassium as basic factors, whilst the oxides of silicon, boron, phosphorus and titanium along with fluorides and fluosilicates furnish the acid characteristics. It must be clearly borne in mind that whatever modifications have been introduced, still, the strongly basic aluminum silicate is always the foundation of the

silicate cement, and may be considered as bearing the same fundamental relation to the silicates as zinc oxide does to the oxy-phosphates.

When preparing the silicate powder, the raw materials are sifted and mixed, then fused at a temperature of from 2,000° F. to 2,500° F. to a homogenous liquid, thus insuring density and uniformity. This forms the "melt" referred to previously. It resembles porcelain in appearance, and is poured from the crucible. The frit is broken up and ground in ball mills, and after sifting, is ready for use.

The liquid differs from that of the oxy-phosphates only in its being, in general, a less concentrated solution of acid phosphate and phosphoric acid. An intimate study of the chemistry of the silicates shows that when the liquid and powder are mixed together, the phosphoric acid reacts with the powder, producing the acid phosphates of calcium and aluminum. These acid phosphates and those already present in the liquid react with more powder, resulting in the normal phosphates of calcium and aluminum and water. During these reactions, some free silicic acid separates out, due to the decomposition of the complex silicates by the acid. To the phosphates of calcium and aluminum are due the cementing and adhesive properties of the cement, hence the more complete the reaction between powder and liquid the better is the filling that is produced.

The reaction which takes place when mixing the powder and liquid of a cement is a chemical one. Now, we know that any chemical reaction is dependent upon the number of molecules of the reacting substance which can come into intimate contact with each other. The more thoroughly the powder and liquid are mixed together, the greater is the possibility of fresh molecules of the liquid reaching the new surfaces of the powder.

Temperature also is an important factor in the mixing of cements. In general, a rise in temperature increases the rate of the reaction, therefore it is an advantage to carry out any given operation at as definite a temperature as possible. For this reason, the chilling of the cement mixing slabs is advantageous in the warm weather.

Again, the quantities of powder added to the liquid, the rate at which the powder is added, and the duration of spatulation; all exert an important influence upon the final result. The addition to the liquid of large instead of small portions of powder, tends to produce great heat (heat of neutralization), and the mass does not retain its plasticity for as long a time as it otherwise would. Both the strength and durability of the cement are depreciated by the addition of the powder either too rapidly or too freely. It is best to determine experimentally all these factors and carry out each operation uniformly.

When a silicate cement filling has been inserted in a cavity it may be said to undergo two distinct periods of hardening, viz., the primary setting, which requires from five to twenty minutes, and the secondary hardening, which continues over a longer period—months or even

years elapsing before the completion of the final stage. The major part of the hardening, however, is complete in twenty-four hours.

An explanation of these two phases of the hardening process may be offered: The primary stage is analogous to that of the oxy-phosphates, and consists in the combination of the metallic phosphates with water; the secondary hardening is probably due to the slow hydration of calcium aluminum silicate and the drying out of colloidal silicic acid.

The repeated references to the importance of water in the hardening process of silicate cements might be interpreted as discounting the use of the rubber dam whilst inserting the filling. Because of this possibility, emphasis must be placed upon the fact that whilst in a plastic condition, silicates are *not* hydraulic, and must be protected from excessive moisture. The reason is that in the mixing and hardening processes the *soluble* acid phosphates are changed into insoluble hydrated phosphates.

On account of the length of time taken for the initial hardening it is best not to attempt the polishing of a silicate filling until it has been in place at least twenty-four hours. A protection of some form of varnish, applied to the rough filling, will aid in carrying it over until such time as it can be properly polished. Engineering practice with Portland cement has shown clearly that it is best to allow the mix to remain undisturbed for some time after the setting process has begun. It is a fair inference then, that this is good practice also with other cements, for the chemistry is the same for all.

Report of the Ontario Oral Hygiene Committee of the Ontario Dental Society, May, 1918

Executive Committee.

Dr. R. J. Reade, Chairman	Dr. N. S. Coyne, Secretary,
Royal Bank Bldg., Toronto	533 St. Clair Ave. W., Toronto
" W. Cecil Trotter, Toronto	" Arthur W. Ellis, Treasurer,
" Wallace Secombe, Toronto	Traders Bank Bldg., Toronto
" R. G. McLaughlin, Toronto	" H. E. Eaton, Toronto
" D. M. Foster, Guelph	" A. E. Rudell, Kitchener
" H. A. Parker, Gananoque	" W. B. Cavanagh, Cornwall
" J. A. Bothwell, Stratford	" M. G. McElhinney, Ottawa.
" W. J. Bruce, Kincardine	" F. R. Watson, Georgetown
" D. C. Smith, Stouffville	" E. Kelly, Hamilton
" O. A. Marshall, Belleville	" J. A. Bothwell, Toronto
" C. W. McBride, Smith's Falls	" F. C. Husband, Toronto
" F. E. Bennett, St. Thomas	" F. J. Conboy, Toronto

Belleville Oral Hygiene Committee.

Dr. O. A. Marshall, Chairman	Dr. M. A. Day, Secretary
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Kitchener Oral Hygiene Committee.

Dr. A. E. Rudell, Chairman	Dr. L. A. Koepell, Secretary.
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Central Ontario Oral Hygiene Committee.

Dr. D. C. Smith, Chairman	Dr. H. N. Wilkinson, Secretary
Stouffville	Newmarket
" C. H. R. Clark, Newmarket	" R. M. Stewart, Markham
" J. W. Barker, Cannington	" W. Adams, Whitby

Cornwall Oral Hygiene Committee.

Dr. W. B. Cavanagh, Chairman	Dr. A. A. Smith, Secretary
" O. L. Weaver	" J. A. Lidell
" W. D. Knight	

Elgin Oral Hygiene Committee.

Dr. F. E. Bennett, Chairman	Dr. T. C. Trigger, Secretary
St. Thomas	St. Thomas
" C. C. Lumley, St. Thomas	

Gananoque Oral Hygiene Committee.

Dr. H. A. Parker, Chairman	Dr. A. H. Mabey, Secretary
" J. A. Black	

Georgetown Oral Hygiene Committee.

Dr. F. R. Watson, Chairman	Dr. F. L. Heath, Secretary.
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Guelph Oral Hygiene Committee.

Dr. Douglas M. Foster, Chairman	Dr. F. T. Coghlan, Secretary
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Hamilton Oral Hygiene Committee.

Dr. Ernest Kelly, Chairman	Dr. Chas. M. Ross, Secretary
" J. L. Kappelle	" S. G. Alderson

Ottawa Oral Hygiene Committee.

Dr. Mark G. McElhinney, Chairman	Dr. Oliver Martin
" L. E. Stanley	" Allan Armstrong
" W. C. McCartney	" C. H. Juvet

Stratford Oral Hygiene Committee.

Dr. J. A. Bothwell, Chairman	Dr. H. W. Baker, Secretary
" A. E. Ahrens	" D. R. Nethercott
" S. B. Gray	" E. H. Eidt

Smith's Falls Oral Hygiene Committee.

Dr. C. W. McBride, Chairman	Dr. E. H. Wickware, Secretary
" W. L. Tait	

Toronto Oral Hygiene Committee.

Dr. W. E. Wray, Chairman	Dr. C. E. Brooks, Secretary
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To the Members of the Ontario Dental Society:

The Ontario Dental Society held its annual meeting in May, 1917.

The Society appointed the following members as the Executive of this Oral Hygiene Committee for the year 1917-1918. Doctors Ellis, Conboy, Husband, Eaton and Coyne. The ex-officio members consist of past chairmen of the Executive of the Oral Hygiene Committee, the chairmen of the several sub-committees working in Ontario, and the Dental Officers in charge of the Public Dental Clinics or School Dental Clinics in the Province of Ontario. The ex-officio members for the year 1917-1918 are: Doctors W. Seccombe, W. C. Trotter, J. A. Bothwell, Fuller, London, R. G. McLaughlin, R. J. Reade, and the chairmen of the various sub-committees.

At the sixtieth meeting of the Executive, held at the Crescent Inn, Spadina Ave., on June 26th, 1917, the following members were present: Doctors Reade, Eaton, Trotter, McLaughlin, Bothwell, Husband and Coyne.

The results of the election of officers of the Executive were as follows: Dr. R. J. Reade, Chairman; Dr. H. E. Eaton, Vice-Chairman; Dr. N. S. Coyne, Secretary; Dr. A. W. Ellis, Treasurer.

The Committee decided to proceed along the main line of work of last year, and take the matter of rural dental inspection to the Provincial Government.

Attention also was to be given to the school teachers' conventions. Last year, an effort was made to outline the manner in which the subject of Oral Hygiene should be presented by dental lectures. This year, an outline was prepared, and may be had on application.

During the year, the Executive held eight meetings.

Regarding addresses to the Teachers' Conventions, there was correspondence sent to the following:—Doctors A. A. Hicks, Chatham; F. Kilmer, St. Catharines; W. B. Cavanagh, Cornwall; E. E. Bruce, Kincardine; M. A. Morrison, Peterboro; O. A. Marshall, Belleville; F. R. Watson, Georgetown; M. A. Ross Thomas, London; O. Lee Roy Heath, Woodstock; O. S. Clappison, Hamilton; Sparks, Kingston; Gowan, Brockville.

Your Committee secured lecturers to address six Teachers' Conventions.

Your Committee, during the year, was asked to prepare a chapter on "The Care of the Teeth" for the Public School Hygiene, edited by Dr. Knight, of Kingston. The chapter was prepared, and is now in Dr. Knight's hands.

During the year, your Committee received a request from Mr. W. J. Dunlop, B.A., Managing Director of "The School," a monthly magazine, with a circulation of 5,000 copies, edited by the staff of the Faculty of Education of the University of Toronto, for an article on Rural Dental Inspection. Your Committee appointed Dr. F. J. Conboy to write this article, which has since appeared in "The School."

Your Committee are in conference with Dr. Kendall, of Gravenhurst Sanitarium, regarding the establishment of a dental clinic for the tubercular patients at Gravenhurst.

A copy of the last Annual Report was mailed to every dentist in Ontario.

Charts for the purpose of lecturing have been loaned to different members of the profession throughout the province during the past year. Acting on the instructions of the Ontario Dental Society, your Committee held the annual conference of the Oral Hygiene Committee in Toronto on Tuesday, November 20th, the following programme was arranged and carried out:—

The delegates assembled at the College Building at 1.30 p.m., when the motors were in waiting to take them to the Parliament Buildings in Queen's Park to meet Premier Hearst and other members of the Provincial Government to urge upon them the necessity of

establishing a system of rural dental inspection throughout Ontario. Dr. Conboy introduced the delegates, and Dr. Seccombe, and Inspector Taylor, of St. Thomas, addressed the members of the Cabinet.

The Government gave the deputation considerable encouragement in the matter.

From the Parliament Buildings, the delegates were motored to the Military Convalescent Hospital at Davisville, after inspecting which, they proceeded to the Walker House for dinner.

After dinner, Dr. Conboy addressed the delegates on the subject of the necessity of rural dental inspection. The subject was then open to the delegates for discussion.

Several school inspectors of the province also attended the Conference.

The following is a list of the delegates present:—Captain H. S. Thompson, N. Toronto Hospital; Dr. W. A. Black, Toronto; Captain F. W. Barbour, Base Hospital, Toronto; Dr. J. F. Simpson, Trenton; Dr. W. E. Willmott, Toronto; Dr. J. A. Bothwell, Stratford; Dr. J. A. McDonagh, Toronto; Dr. W. T. Ganton, Uxbridge; Dr. R. M. Stewart, Markham; Dr. Arthur Ellis, Toronto; Dr. C. A. Liscumb, Drayton; Dr. C. V. Fisk, Toronto; Dr. F. R. Watson, Georgetown; Dr. D. Baird, Toronto; Dr. R. W. Hoffman, Toronto; Dr. C. R. Collard, Toronto; Dr. J. E. Middleton, Peterboro; Dr. H. F. Kinsman, Sarnia; Dr. C. A. Snell, Toronto; Dr. A. A. Hicks, Chatham; Dr. F. E. Bennett, St. Thomas; Dr. C. A. Kennedy, Toronto; Dr. Edgar W. Paul, Toronto; Dr. George G. Jordan, Toronto; Dr. W. E. Wray, Toronto; Dr. H. E. Eaton, Toronto; Dr. Wallace Seccombe, Toronto; Dr. R. G. McLaughlin, Toronto; Inspector J. A. Taylor, St. Thomas; Dr. R. J. Reade, Toronto; Dr. F. Conboy, Toronto; Dr. J. A. Bothwell, Toronto; Inspector J. M. Denyes, Milton; Dr. George Grieve, Toronto; Dr. E. A. Hill, Sudbury; Dr. R. C. Davis, St. Catharines; Dr. A. E. Webster, Toronto; Dr. F. Husband, Toronto; Dr. O. A. Marshall, Belleville; Dr. T. F. Rhind, Toronto; Dr. W. Cecil Trotter, Toronto; Dr. T. F. Campbell, Galt; Dr. C. E. Stewart, Elmira; Captain H. A. Semple, Toronto; Dr. N. S. Coyne, Toronto.

During the year, your Committee received communications from Dr. Liberty, of Cobalt, and Dr. Corrigan, of Strathroy, asking for facts and figures regarding the matter of dental inspection in Toronto public schools. The above two municipalities have practically decided to institute a system of dental inspection in their schools.

Your Committee held a consultation with the Provincial Officer of Health for the purpose of gaining his co-operation and support in obtaining the necessary authority and legislation for the introduction of dental inspection into the rural schools of the Province. Dr. McCullough expressed himself in hearty sympathy with the movement, and agreed that a dental officer attached to the Provincial Depart-

ment of Health, would materially assist in safeguarding the health of the Province.

As a result of the above conference, and acting upon the suggestion of Dr. McCullough, we would respectfully recommend that next year's Oral Hygiene Committee take up this question and secure authoritative reports from every country regarding the operation of rural dental inspection, and that the plan suggested by this Committee, as best suited for the Province of Ontario, should be tested out in one or more rural communities and, for this purpose, the interest of the local Women's Institute, Educational Boards, health officers and dentists be secured and a complete report prepared for presentation to the Ontario Government, covering the results of these tests and the reports of similar work undertaken outside this Province.

A public health section has been organized in connection with the Ontario Educational Association, and two of the officers of this organization are members of the Oral Hygiene Committee. Your Committee are glad to be able to report that two of its members were able to be of service in assisting in the formation of this organization. Your Committee are in hopes that the dental profession throughout the Province will support, in every way possible, this organization.

N. S. COYNE,

Secretary.

ROBERT J. READE,

Chairman.

REPORTS OF COMMITTEES.

CENTRAL ONTARIO ORAL HYGIENE COMMITTEE.

Dr. D. C. Smith, Stouffville, Chairman, Central Ontario Oral Hygiene Committee, reports a few addresses given on Oral Hygiene and some advertising in local papers.

ELGIN ORAL HYGIENE COMMITTEE.

Dr. D. C. Trigger, Secretary, Elgin Oral Hygiene Committee, reports as follows:—West Elgin Teachers' Association, in session at St. Thomas recently, unanimously asked to have dental and medical inspection established at the earliest possible moment.

The nurse in St. Thomas public schools states that there has been much improvement among all the pupils since dental inspection was undertaken in their schools.

SMITH'S FALLS ORAL HYGIENE COMMITTEE.

Dr. C. W. McBride, Chairman of the Smith's Falls Oral Hygiene Committee, reports as follows:—We have had several schemes under consideration, but as yet have not accomplished anything, other than exhibiting charts in the public schools, and have urged upon the teachers that they impress upon their pupils the necessity of the regular care of the teeth. We had arrangements about completed for dental inspection in the schools, when one of the buildings was burned,

which disorganized the system. We will take the matter up again, however, in the near future; probably next term.

KITCHENER ORAL HYGIENE COMMITTEE..

The above Committee send the following report, through their chairman, Dr. A. E. Rudell. The public generally here are now receiving results of former efforts along the line of public school Dental Inspection, which was established in our school about three years ago.

School nursing has been thoroughly established in our school, and is here to stay.

The splendid results obtained have convinced everyone of the great importance of having the children's mouths regularly examined by a nurse, so that parents may become aware of any defects as soon as they make their appearance.

We have a very competent nurse, and her vigilance has prevented the loss of a large percentage of six-year molars.

We have given a few talks before the Mothers' Club.

We find there is nothing in the schools to-day more appreciated by the mothers than the school-nursing department.

CORNWALL ORAL HYGIENE COMMITTEE.

Dr. W. B. Cavanagh, Chairman of the Cornwall O.H.C., sends the following report:—The Cornwall Public School Board has engaged a nurse (representing the Victorian Order) to visit the school once a month, examine the teeth of pupils and give examination charts to the children, if they are in need of dental attention. The cards must be signed by the family dentist, when the mouth has been put in proper condition.

The Separate School Board has issued a circular, setting forth the necessity of dental attention, and asking the parents to give every care to their children's teeth.

The dentists of Cornwall have undertaken, through The Daughters of the Empire, to take care of the teeth of the children of the soldiers at the Front, free of charge, if the parents are unable to pay for the treatment.

At the annual meeting of the teachers of the County of Stormont, Dr. Webster read a most interesting paper, which is having effect throughout the county. Teachers who previously took no interest in the condition of the mouths of their pupils, are now advising them to give close attention to the teeth.

GUELPH ORAL HYGIENE COMMITTEE.

Dr. D. M. Foster, Chairman of the Guelph Oral Hygiene Committee, reports as follows:—It is three years since the Local Committee sent you a report. This is due to the fact that the Chairman and Secretary both left for overseas in the fall of 1915, but in the mean-

time, the other members of the Committee have been carrying on the work. Lectures to parents and teachers have been given, and it is evident in every dental practice that these talks are bearing fruit. Above all, the Board of Education, some two years ago, appointed a school nurse, who is carrying on a campaign of education. This appointment was largely due to the work at the Local Committee, which examined and made a report on the condition of a large number of the school children of the city.

A word might be said here about a great educational factor; I refer to the Canadian Army Dental Corps. Thousands of men, who never thought of going themselves, or of sending their families to a dentist, are experiencing the comfort and relief given by the Dental Officer, and henceforth will be exponents of Oral Hygiene.

OTTAWA ORAL HYGIENE COMMITTEE.

Dr. Mark G. McElhinney, Chairman of the Ottawa O. H. C., sends the following report:—The Committee has not been very active during the past year, but is holding itself in readiness to carry out any system of inspection in the County of Carleton, which may be outlined for us by the Central Oral Hygiene Committee in Toronto.

GEORGETOWN ORAL HYGIENE COMMITTEE.

Dr. F. R. Watson, Chairman of the Georgetown O. H. C., makes the following report:—The first inspection of the Georgetown Public School, nearly a year ago, has been a success and a benefit beyond expectation, and conditions are correspondingly improved. Scholars, teachers, parents and school board no longer question, but are strongly in favor of Dental Inspection.

The Board has asked for a yearly examination, and this will be undertaken soon. It is also proposed to have an address delivered by a member of the Central Oral Hygiene Committee, of Toronto, to the children and parents immediately after the examination.

FINANCIAL STATEMENT, ORAL HYGIENE COMMITTEE OF ONTARIO DENTAL SOCIETY.

JULY 1ST, 1917, TO APRIL 1ST, 1918.

RECEIPTS.

Cash Balance	\$1 06
Bank Balance	48 34
Bank Interest	0 72
Grant from Ontario Dental Society	200 00
	<hr/>
	\$250 12

DISBURSEMENTS.

Stamps	\$25 00
Expenses—Lectures to Teachers' Conventions	47 80
Banquet to Delegates at Convention	49 00
Reports	54 50
Sundries	4 50
Committee Expenses	15 50
Balance in Bank	53 52
Balance on Hand	0 30
	<hr/>
	\$250 12

ARTHUR W. ELLIS,
Treasurer.

The Ontario Dental Society Meeting

H. A. McKIM, D.D.S., TORONTO, CHAIRMAN OF CONVENTION
PROGRAMME COMMITTEE.

WHAT the college is to the student, the Ontario Dental Society is or should be to the practitioner. Shut in with his own problems and ordinary office routine he looks forward to the annual convention for profit and pleasure. It is here that his problems are discussed by some of the best men in the profession, and here he meets former chums of college time. Such seemed to be the experiences of those who attended the recent meeting of the O.D.S., held from April 29th to May 2nd, 1918.

This was particularly pleasing to the members of the programme committee. Because of the war and all associated adverse conditions, special difficulty was experienced in securing suitable lecturers. Because of embargoes many exhibitors were unable to take part. The registration however, totalled 212, and every man present showed interest and appreciation. As was expected, Dr. C. N. Johnson was the chief attraction. A fluent speaker, of marked ability, he always graces the programme on which he appears. The papers of Drs. Smith, Vogt, and Dean Webster were also followed closely and were well discussed. The work of the Canadian Army Dental Corps at home and overseas was well presented by Major Green of Ottawa, and Captains Thomson and Barbour, of Toronto.

During the convention some very important matters were discussed. One was introduced by Dr. W. E. Willmott, viz., the reorganization of the whole executive committee. Each year a number of men are appointed, who, with the President, Secretary, Treasurer and Presidents of all local dental societies form the executive. This does not seem workable, and experience suggests a radical change.

Because most of the officers are scattered widely throughout the province, it necessarily follows that they cannot be closely in touch, and do not know what is being done. Also the work of organizing a convention, securing essayists, exhibits etc., is a big undertaking involving much detail work. It is therefore suggested that a permanent secretary-treasurer be appointed, at a salary to be arranged, who shall be responsible for all the correspondence and details involved. With him should be an advisory committee, but the executive work would be done by the permanent officer. A committee was appointed to go into the whole matter.

Another important question was introduced by Dean Webster. The Canadian Dental Association has been invited to meet with the National Dental Association at Chicago, and have been asked to put on one session. Because Canada has been in the War since the beginning, and has a casualty list of jaw cases now well over 50,000, there is a request that the Canadian session be given to Dental War Prosthesis. This means, of course, that steps be taken to procure someone who has had plenty of experience in handling such work. Moreover, since the civilian dentist will have to take charge of such work soon, he should be trained in a post-graduate course. To this end a committee was appointed, viz., Dean Webster, Dr. F. J. Conboy and Dr. S. Bradley, to get in touch with the proper authorities with a view to securing Lieut.-Col. Guy G. Hume, of Orpington Hospital, and Dr. Villier, of France, either of whom represent the best in War Prosthesis. Here is wishing our committee great success!

Because of the recent report of Mr. Justice Hodgins there was some discussion regarding the recommendations which he makes. One suggestion is the appointment of "Taxing Officers" whose duty it will be to arbitrate in all cases of misunderstanding re fee between patient and practitioner both in the medical and dental professions. However, Justice Hodgins offers another recommendation which is rather peculiar from a Dental standpoint, at least. By thrift and good management the Royal College of Dental Surgeons of Ontario shows a yearly surplus of over \$5,600. This in six years would remove all indebtedness. His Honor then strongly recommends "that hereafter all examination and licentiate fees, less expenses of examination, be paid over to the University to be used for the exclusive benefit of the Medical Faculty, whose expenses are and will be exceptionally heavy and continually increasing." There are several ways in which the surplus could be better spent. Could the Board do better than conduct an active propaganda to raise the status and efficiency of dentistry? Some time ago there was considerable talk regarding sterilization methods in the average dental office and a suggestion that a standard be set to which every man should measure up. Has anything been done? Another channel would be the considering of post-graduate clinics throughout the province. About

950 men are practising in Ontario and 150 are in the C.A.D.C., and yet only 212 registered at the Ontario Dental Society. Could not the other men be reached? A third suggestion might be the organization of a course for assistants. Something along this line may be worked out in connection with the next O.D.S. meeting, which will most likely be in the form of a progressive clinic.

Those in Attendance at the O.D.S. Convention

A.

Dr. Abbott, E. C., Toronto
 " Abbott, J. M., Erin
 " Adams, J. Frank, Toronto
 " Alford, H. F., Toronto
 " Allen, A. H., Paisley
 " Amy, W. B., Toronto
 " Anderson, J. L., Oakville
 " Armstrong, J. W., Toronto
 " Arnott, H. C., Oshawa
 " Adams, J. G., Toronto

B.

Dr. Baird, D., Toronto
 " Ball, E. S., Toronto
 " Bansley, J. C., Toronto
 " Barron, F., Paris
 " Barker, E. R., Stouffville
 " Barker, J. W., Cannington
 " Beam, Chas. O., St. Catharines
 " Beaton, D. H., Toronto
 " Bell, F. E., Toronto
 " Berry, R. N., Caledonia
 " Beir, E. R., Toronto
 " Billings, M. R., Cayuga
 " Bothwell, J. A., Toronto
 " Boyle, L. F., Toronto
 " Bracken, B. M., Grand Valley
 " Bradley, Sydney W., Ottawa
 " Brereton, M. L., Barrie
 " Brick, W. G., Windsor
 " Brooks, C. E., Toronto
 " Broughton, A. J., Toronto
 " Brown, A. J., Mitchell
 " Brown, J. W. E., Peterboro'
 " Brown, W. W., Toronto
 " Burns, W. W., St. Thomas.

C.

Dr. Campbell, E. H., Orangeville
 " Campbell, F. J., Galt
 " Capon, F. J., Toronto
 " Cation, J. M., Toronto
 " Chalmers, W. L., Alexandria
 " Chambers, J. S., Toronto
 " Clark, Harold, Toronto
 " Clarke, M. J., Belleville
 " Coates, J. W., Wallaceburg
 " Collard, C. R., Toronto
 " Conboy, F. J., Toronto
 " Coon, W. H., Toronto
 " Cowen, R. H., Hamilton
 " Coyne, N. S., Toronto
 " Craig, J. J., Bowmanville
 " Crawford, J. C., Haileybury
 " Crysler, P. E., Simcoe
 " Cummer, W. E., Toronto
 " Cunningham, Hugh, Toronto
 " Cunningham, O. A., London
 " Currie, T. A., Toronto
 " Crockett, J. R. (Capt.) Toronto
 " Corland, C. B., Oakville

D.

Dr. Dalrymple, W. A., Toronto
 " Davis, R. C., St. Catharines
 " Dawson, T. W., Toronto
 " Day, P. S., Harrowsmith
 " Day, Arthur, Toronto
 " Day, M. A., Belleville
 " Devitt, J. C., Bowmanville
 " Dolson, E. A., Toronto
 " Drummond, J. A., Petrolia

E.

Dr. Eaton, H. E., Toronto
 " Eckel, S., Waterloo
 " Ellis, Arthur W., Toronto
 " Ely, E. M., Ottawa

F.

Dr. Fisher, R. E., Toronto
 " Fleming, J. A., Prescott
 " Frain, J. H., Norwich
 " Fraser, Grant, Madoc
 " French, H. G., Dresden
 " Fuller, E. W., London
 " Fleming, W. A., Alliston
 " Fulton, E. M., Hamilton

G.

Dr. Gausby, E. L., Toronto
 " Ganton, W. F., Uxbridge
 " Glover, W. R., Kingston
 " Godwin, W., Welland
 " Graham, R. M., Ottawa
 " Grassl, J. G., Welland
 " Gray, S. B., Toronto
 " Greene, W. R., Ottawa

H.

Dr. Hart, E., Brantford
 " Hartman, H. M., Meaford
 " Harwood, F. C., Moose Jaw
 " Hicks, G., Watford
 " Hill, A. N., Dundas
 " Hill, E. A., Sudbury
 " Hill, W. J., Alliston
 " Hilliard, J. A., Kitchener
 " Hoffman, R. W., Toronto
 " Holmes, Harry A., Toronto
 " Husband, F. C., Toronto
 " Husband, T. H., Hamilton
 " Hutchinson, J. M., London

I.

Dr. Ingram, J. W., Toronto
 " Irwin, H., Lindsay

J.

Dr. Jarman, F. S., Bancroft
 " Jarvis, R. D., London
 " Jeffs, W. T., Dresden
 " Jamison, A., Millbrook
 " Jordan, A. R., Toronto
 " Jordan, G. G., Toronto

K.

- Dr. Kennedy, G. T., St. Thomas
- " Kennedy, C. A., Toronto
- " Kilmer, F., St. Catharines
- " Kinsman, A. R., Exeter

L.

- Dr. Laflamme, Capt. W. J.
- " Laing, R. E., Dundas
- " Laker, W. J., Toronto
- " Law, F. G., Toronto
- " Lee, G. A., Whitby
- " Leggett, W. C., Toronto
- " Lester, A. V., Hamilton
- " Leuty, H. D., Toronto
- " Linscott, B. W., Brantford
- " Locheed, J. A., Hamilton
- " Lundy, W. E., Toronto
- " Lymburner, W. C., Smithville
- " Lederman, S., Kitchener

M.

- Dr. Macdonald, W. W., Toronto
- " MacDonell, H. G., Goderich
- " Macfarlane, R., Kitchener
- " MacLaren, W. A., Toronto
- " Madill, W. S., Toronto
- " Mallory, F. W., Toronto
- " Mathison, W. A., Toronto
- " Mitchell, M., Fort William
- " Mills, G. K., Tilbury
- " Morrow, W. M., Hamilton
- " Morgan, W. E., North Bay
- " Morrison, M. A., Peterboro
- " McCaughey, S. G., Ottawa
- " McDonagh, A. J., Toronto
- " McGahey, R. J., Toronto
- " McKim, H. A., Toronto
- " McKinley, G. C., Toronto
- " MacLachlan, J. P., Toronto
- " McLachlan, W. C., Toronto
- " McLaughlin, R. G., Toronto
- " McLean, R. G., Toronto

N.

- Dr. Nash, C. C., Kingston
 - " Nesbitt, H. A., Lindsay
 - " Newton, G. A., Lucknow
- O.
- Dr. O'Flynn, J. F., St. Catharines
 - " Oliver, E. W., Almonte
 - " Overholt, J. E., Hamilton

P.

- Dr. Patterson, R. A., Kemptville
- " Paul, E. W., Toronto
- " Pearson, C. E., Toronto
- " Price, R. F., Toronto
- " Proudfoot, P. B., Russell

R.

- Dr. Reid, H. W., Toronto
- " Rhind, J. E., Toronto
- " Richardson, H. K., Toronto
- " Robertson, H. A., Hamilton
- " Ross, C. M., Hamilton

- Dr. Ross, J. F., Toronto.
- " Roulston, G. F., Exeter
- " Ruddell, A. E., Kitchener
- " Russell, D. E., Brantford
- " Rutherford, M., Toronto
- " Ryan, J., Toronto

S.

- Dr. Scott, C. G., Toronto
- " Seccombe, Wallace, Toronto
- " Sellery, F. W., Toronto
- " Shantz, W. B., Kitchener
- " Simpson, J. F., Trenton
- " Sivers, W. M., Toronto
- " Slade, J. A., Toronto
- " Smith, C. E. J., London
- " Smith, G. D., Port Dover
- " Smith, W. C., Toronto
- " Smith, L. G., Toronto
- " Snell, C. A., Toronto
- " Somerville, W. R., Haileybury
- " Sparks, R. E., Kingston
- " Spaulding, W. R., Toronto
- " Spence, W. G. E., Listowel
- " Sprott, R. J., Barrie
- " Stanley, L. E., Ottawa
- " Stewart, J. N., Hamilton
- " Stewart, R. M., Markham

T.

- Dr. Tanner, L. E. W., Toronto
- " Thomas, W. A. R., London
- " Thomson, A. S., Toronto
- " Thomson, L. G., Toronto
- " Thornton, R. D., Toronto
- " Tisdale, M. C., Hamilton
- " Topp, J. W. B., Bracebridge
- " Trotter, W. Cecil, Toronto
- " Thornton (Capt.) W. W., Toronto

V.

- Dr. Vance, R. J., Waterdown
- " Vogt, C. E.

W.

- Dr. Waldron, C. H., Toronto
- " Wallace, R. D., Toronto
- " Watson, W. D., Brantford
- " Watson, F. R., Georgetown
- " Watson, O. C., Campbellford
- " Ward, R. G., Toronto
- " Webster, A. E., Toronto
- " Weldon, A. M., Peterboro
- " Wickett, W. C., Toronto
- " Willard, W. T., Toronto
- " Wilkinson, H. N., Newmarket
- " Willmott, W. E., Toronto
- " Wilson, B. E., Toronto
- " Woods, W. J., Toronto
- " Wray, W. E., Toronto
- " Wright, G. F., Trenton
- " Wylie, T. H., Toronto
- " Woollatt, Capt. R. S., Toronto

Z.

- Dr. Zeigler, O. H., Toronto
- " Zinkan, E. I., Toronto
- " Zimmerman, Capt. G. F., Toronto

Maritime Dental College—Dalhousie

THE convocation of the Faculty of Dentistry was held May 30th, 1918. The following candidates received the degree of Doctor of Dental Surgery:—Howard John Adamson, Lindsay Melbourne Finigan, Guy Nobles Stultz.

FRANK WOODBURY, DEAN.

State Dentistry*

RICHARD G. McLAUGHLIN, D.D.S., TORONTO.

Mr. Chairman and Members of the Toronto School Dental Staff:

I APPRECIATE the honor you have done me in this invitation to speak to you on the very important subject of State Dentistry.

I assure you, I also appreciate the responsibility of making any definite statements on a subject that is, as yet, in the formative period and which promises so much if wisely guided, as does State Dentistry. As this great undertaking is still in its infancy, we have as yet few precedents of value to guide us in our deliberations. I might even say without appearing at all egotistic, that we in Toronto are to-day in the vanguard in this work of school dentistry. So, in considering the future of this movement, we ought to have not only our present plans definitely before us, but also our ideal and our ambitions for the future.

PURPOSE OF CONFERENCE.

I believe that this is the first conference of this nature that the School Dentists of Toronto have held, and no doubt it has been convened for a definite purpose, and one of the main results sought after would be that of inspiration. That by coming together in this way you might get a view of this great work through the eyes of others, and thus gain a vision of the far-reaching effects of the service you are rendering. To really produce your best results to-day, you must look beyond the mere daily toil amongst the children of the classroom or the school clinic and see in the future years, these very boys and girls taking the leading places in life, largely because they have maintained their physical fitness as a result of your work and your instructions in the matter of proper mouth conditions.

STATE CONTROL.

State control, in this country, has developed somewhat slowly, but war conditions have given it a new lease of life, if not a new birth. By degrees the great public utilities are being brought under government control, until now the authorities, to a certain extent, are taking under their guidance the distribution of the nation's food supply. Why state control? Is not such a step on the part of the government an infringement of the constitutional rights of a free people? The answer to all such objections is the public welfare. All legislation has that end in view.

Such an answer gives the strongest kind of reason for the introduc-

* Address delivered at the Easter Conference of the Toronto School Dental Staff, April 2nd and 3rd, 1918.

tion of state dentistry. What is state dentistry? Briefly it infers that the state shall take upon itself the responsibility of insuring that each citizen, from childhood to old age, is possessed of a clean and healthy mouth. That is the ideal to be aimed at in oral conditions.

HOW FAR SHOULD THE STATE GO?

Just how far the state should go in the aforesaid responsibility is an important question. The extremist advocates state control of the entire medical and dental professions. That the members of these professions should become employees of the Government, and one should be stationed in a certain community and become responsible to the Government for the health of the members of that community. Such a proposition has been mooted in the Government circles in Great Britain within the last year. Here in Ontario we do not favor such a radical step, which we feel would not be in the best interests of either the public or the healing professions.

NEW ZEALAND.

New Zealand has before its Government to-day, a proposition for state dentistry which, for originality and completeness, has much to commend it. The Government of that country was asked to inaugurate a dental department over which would be appointed a Director, responsible immediately to the Cabinet. This Director would have at his service a sufficient number of dental inspectors and practising dentists, to look after the dental needs of all the school children in the country, save those who would be taken care of by the private practitioner.

To insure a sufficient number of school dentists that the extra service would demand, it was recommended that students would receive free education at the dental college together with a living allowance, while at college, and in return for which they would serve the state, under bond, for five years as school dentists, at a stated salary, after which they would have the option of continuing in the state service or of entering private practice.

This proposition appealed very strongly to the New Zealand Government, including the Officer of Health, but the stumbling block to its adoption was the enormous initial cost of the undertaking. An estimated cost of at least £100,000 to put the scheme into operation was more than could be set aside for a new undertaking in war time. However, the magnitude of the New Zealand proposition indicates how seriously civilized countries are taking up the matter of bettering the mouth conditions of their citizens.

WHAT ARE WE AIMING AT IN ONTARIO?

Our immediate aim for Ontario, in short, is this: To have the Government bring in the necessary legislation to insure that every boy and

girl in our schools shall have their teeth examined at stated intervals, and a proper report sent to the parents or guardians, and that all school children shall receive proper instruction as to the importance and care of the teeth.

In order that this may be accomplished satisfactorily in the rural sections the Oral Hygiene Committee is urging upon the Provincial Government a plan which might be outlined as follows:

First: That a Dental Department be established in connection with the Provincial Board of Health.

Second: That a Director of Dental Services be appointed as head of the department.

Third: That this appointment be followed by the appointment of three or four dental inspectors as the work progresses and their services are found necessary.

Fourth: That necessary legislation be introduced to enable any township or county as a unit to introduce dental inspection into the schools within the bounds of such a community.

Fifth: That any such township, having decided on dental inspection, should have the services of one of the dental inspectors, who shall carry out an examination of the children's teeth in such schools; give proper instruction as to the importance and care of the teeth and, whenever possible, deliver an illustrated lecture in the schoolroom the same evening to which the parents and friends will be invited.

Such would be the beginning of this work, which would eventually spread to all parts of the province, and not only would this be made to cover the children in our schools, but eventually, as the work progressed and its value properly estimated, it would spread into the adult region until every man and woman, whatever their occupation, be compelled to present a clean and healthy mouth with a proper masticating apparatus.

WHEN?

When are we going to have the necessary legislation to introduce dental inspection throughout the provinces? Just as soon as the Government, the Health Departments, and the people get to understand that we cannot be assured of healthy boys and girls, men and women (capable of the maximum efficiency in study, or work, or service of any kind) until we have better teeth and clean mouths.

The industrial world is understanding to-day, as never before, that "physical fitness is a pre-requisite to efficiency," and is just beginning to understand an equally important fact that a clean and healthy mouth is a pre-requisite to physical fitness. The time was when a great industrial organization looked upon its employees as so many hands in the workshop. They came and they went and were paid their wages and right there the interest ended. But these

industrial kings are seeing their mistake. In the largest and best concerns, every man taken into the employ of the company is looked upon as an investment and the more efficient that workman, the better dividends he will pay the company. Therefore, every precaution is taken to keep him fit in every particular so as to render his highest service. Industrial medicine and surgery is playing a large part in industrial efficiency to-day. The employees are regularly examined as to health conditions by the company's physician. The unfit are either weeded out or put under the necessary treatment and instruction to bring about a return to normal conditions.

Now the state should look at its subjects just in that way. Every citizen is an investment on the part of the state and should be so watched and cared for physically, mentally and morally, as to make him an efficient producer in whatever sphere of action he may be engaged.

Our duty, as dentists, is to impress upon the authorities the fact that bad teeth are a direct cause of broken health and therefore of inefficiency, and that if we are to build up a strong and virile race in this country we must see to it that the boys and girls of to-day have their mouths and teeth kept in a healthy condition.

School Dental Service in Toronto

ROBERT E. MILLS, M.A.

Director, Bureau of Records and Statistics, Department of Public Health, Toronto

SCHOOL Dentistry in Toronto, being a phase of the school health service, is supplied by the Department of Public Health. In general, school health service has three main objects, namely, the discovery and correction of physical defects, the development of knowledge and habits of personal hygiene, and the prevention of communicable diseases. With reference to oral conditions these are the purposes of school dental service. Dental defects are merely physical defects of a particular class, and oral hygiene is merely a branch of personal hygiene. Therefore the same system is employed in recording and notifying dental conditions as is used for any other kind of defect, and the same nurses do the follow-up work from the same files.

However, as dental defects greatly outnumber those of other kinds, and as dentistry is a highly specialized art, a special staff of dental examiners is employed to discover defects of the teeth. The school physicians report serious dental conditions, that they believe to be definitely affecting the general health or development of the children

when they make their complete physical examinations, but these examinations occur only twice in a pupil's school life. The dental inspectors examine each child's mouth much more frequently, and they have in view the preservation of the teeth, as well as the improvement of general health conditions. The Provincial Regulations require that "Once every year, and at such times as the Medical Officer of Health may direct, the School Dental Officers shall make an examination of the teeth of all pupils attending the schools." This examination is made without asking consent from the parent.

However, in order to make the dental examination more thorough, to afford an object lesson in oral hygiene and an opportunity for personal instruction, and above all, to give each child a fair start in keeping his teeth clean, a rapid prophylactic cleansing is given where necessary, at the time the dental examination is made. Of course, in cases where this or any other treatment is given, the parents' written consent must first be obtained.

Until recently the examinations were made in the classroom, without instruments, other than a wooden tongue depressor. It has been found that the present method of examination, with prophylactic treatment, discovers a much greater percentage of defects than the simple examination without instruments, and therefore may be considered proportionately more effective. The percentage of children found with defects of the teeth has risen with the recent change in method, from 51 to 74 per cent. of the number examined.

The registered attendance of the public schools is about 64,000, and that of the separate (parochial) schools about 8,000. This means that about 72,000 dental examinations must be made each school year. To accomplish this task, the Department of Health has set apart, for the public schools, five dentists, and for the separate schools, part of the time of two.

A female dental assistant accompanies each of these "survey" dentists, whose function is to enable the dentists to concentrate upon strictly dental work. The dental assistant sees that there is always a child in the chair, that there are always sterilized instruments and the proper supplies at the dentist's hand, that his records are kept, and the parents' notification cards are given to the children to take home. The dentist simply makes the examination and prophylaxis, checks off the defects on the notification and initials same. As an assistant costs less than one-third as much as a dentist, the economy is obvious.

About 53,000 pupils are found annually with dental defects. The defects are noted in detail upon a diagram on the card that is sent to the parent, the nature of the defect being shown against the particular tooth affected. As this card is taken by the parent to the family dentist, the examiner has a strong incentive to careful and accurate

work. A carbon duplicate of this chart, which is the record of the defects discovered, is handed to the school nurse, who files it along with similar carbons of notifications of other kinds of defects, and uses it as a basis for follow-up visiting to obtain action in the case.

Every effort is used to have the parent take the child to a private dentist for treatment but, as some parents are financially unable to avail themselves of private professional service, the Department conducts dental clinics, where treatment is provided for such cases free of cost. These clinics are located in 20 different school centres, with the idea of placing them within walking distance of the schools served.

The work of the dentists in these operative clinics is restricted, as nearly as possible, to actual dentistry. All of the work connected with making appointments and getting the children to the clinics is the responsibility of the nurses, the clinics simply operating upon those children that appear for treatment. In order to increase the work output of the dentists, it is planned to employ assistants wherever possible in these clinics. Because the dentist is comparatively highly priced labor, it is economical for him to do only such work as requires his specialized skill or professional standing, but he should do as much of it as can be squeezed into his three hours a day. Every effort is made to standardize the equipment, supplies, and operations, whether clerical or professional, to obtain the highest possible efficiency.

To minimize the possibility of accident, no anesthetics are supplied to the ordinary school clinics. Such cases as require local or general anesthesia are referred to specially equipped extraction clinics, of which there are two; one for public and the other for separate schools. Of course, these clinics do routine operative work when not actually engaged upon anesthesia cases.

To protect the dentist, an application card must be signed by the parent, and endorsed by the nurse before the dentist commences treatment. He records, upon the back of this application card, the actual work done, and initials each day's entry. In this way the warrant for the work and record of what was done is kept together in the dental clinic in the hands of the dentist, the person for whose protection it is designed.

The number of dentists employed upon operative work in the public schools is eleven, and in the separate schools two. The total school dental staff at present is as follows: public schools, sixteen dentists and four assistants; separate schools, two dentists and two assistants. There is also a Chief of School Dental Service, who is in charge of both groups. In both public and separate schools there is one dentist to about 4,000 pupils.

The dentists and assistants are employed for part time service, working every school day from 9 a.m. to 12.00, and on Friday afternoon from 1.30 to 3.30, the Friday afternoon clinic being for children of

pre-school age. The public school extraction clinic operates from 1.00 to 4.00 p.m. each day, as well as in the morning, a different dentist conducting the afternoon clinic.

The dentists are paid from \$80 to \$95 a month, and the assistants about \$6 a week.

Detroit Dental Club Post-Graduate Clinics

W. CECIL TROTTER, B.A., D.D.S., TORONTO.

THE Michigan State Dental convention was held at Detroit from Monday, April 8th to Friday, April 12th. The convention was one of the best conducted meetings the writer has ever attended. Every subject was presented in a most practical way, being illustrated by charts, lantern slides, moving pictures, or clinical demonstrations. Those present from Canada included, Drs. Gordon McLean, J. F. Ross, Zinkan, Kinsman, Ante and Maybee.

MY IMPRESSIONS OF THE MEETING.

1. Comparative promptness of all sessions as compared with most dental meetings.

2. The growing demand for a more exact, comprehensive and scientific diagnosis before going on with our cases.

3. The commencement of a saner view of focal infection and the demand for more definite proofs that all apical areas of rarification, without exception, are really a source of danger.

4. A demand for absolute, definite aseptic precautions in all root canal operations. This involves sterilization by heat of all instruments, cotton, cotton points, paper points, etc., used in canal work.

5. The endorsement of Dr. Howes suggestion as to the efficacy of Silver Nitrate in treatment of infected dentine in putrescent roots.

6. The growing faith in the efficacy of prophylaxis in preventing decay and future root trouble.

7. The absolute and definite systems available for the making of perfectly fitting porcelain crowns for all teeth and for the making of either gold or porcelain inlays, all by the indirect method. These systems seem quite within the capabilities of the average assistant.

8. The large number of cases in which jacket crowns are applicable and desirable.

Dr. Elmer S. Best, of Minneapolis, outlined his methods of securing a comprehensive and accurate diagnosis of a case before proceeding with any operation. He advocated radiographing the whole mouth in every case and always doing it by a regular system of blocking. The mouth is blocked out into ten areas as follows:—

(1) Upper right three molars.

(2) Upper right bicuspid and cuspid.

- (3) Upper incisors.
- (4) Upper left bicuspid and cuspid.
- (5) Upper left molars.
- (6) Lower right three molars.
- (7) Lower right bicuspid and cuspid.
- (8) Lower incisors.
- (9) Lower left bicuspid and cuspid.
- (10) Lower left molars.

And the radiographs arranged in two rows, upper and lower, in the above order, thus presenting a complete set of teeth as viewed from the interior of the mouth. The vitality of every tooth at all in doubt, is to be definitely ascertained by thermal or electrical tests, the latter being preferred by Dr. Best. Roots presenting very unfavorable apical areas are to be extracted. Roots presenting less unfavorable apical areas are to be amputated. Roots presenting favorable apical areas are to be thoroughly and aseptically filled.

On the diagnostic charts vital teeth are designated by the X-sign and non-vital teeth by the — sign.

On the charts, the relative solidity, firmness and integrity of each tooth is designated, also the degree of gingivitis present, if any. The relative urgency or otherwise for operative procedures is also designated on the chart. In order to get all this information the use of accurately articulated study models are advocated. Every tooth left or replaced must be conducive to the future health of the patient.

TABLE SHOWING RELATIVE CONDITION OF ANY TOOTH.

	1	2	3	4
Relative firmness in alveolus			X	
Condition or relative gingivitis				X
Relative decay		X		
Relative condition of fillings			X	
Condition of pulp or apical areas				X
Case number				

If, under these various headings, a tooth was classified as 3 or 4, under several conditions, it would indicate advisability of extraction. If classified under most conditions as 1 or 2, corrective measures would be indicated. The following operative procedures were advocated in root canal treatment:—

1. Swabbing the tooth and surrounding tissues with iodine solution.
2. Apply rubber dam which has previously been sterilized by boiling or by immersion in strong disinfectant.
3. Use rubber dam clamp which has been sterilized.
4. Wash tooth with green soap solution or alcohol.
5. Wash cavity with iodine solution.
6. Dissolve out any gutta percha in canals with zylol solution.
7. Use sterilized Rhein picks or probes to open into canals.

8. Enlarge canals with sulphuric acid or phenol sulphonic and the use of files and barbed broaches, especially the short barbed broach. The apical portion of canal is cleaned by means of an "apex curette."

9. Measure with a sterilized diagnostic wire and radiograph, when sure that apex has been reached, apply paper point dressing of Dakins solution or normal salt solution and seal with zinc chloride cement (if not completing operation at first sitting).

10. Remove dressing and ionize.

11. Pump chloroform and chloropercha into canal, also resin. Use sterile smooth broaches to do this.

12. Introduce sterilized gutta percha points into chloroform, resin solution in canals.

13. Seal pulp chamber with zinc chloride cement. All cotton pellets, Johnson & Johnson points, Mayo sponges, etc., must be sterilized with dry heat.

A reservation of not less than two hours is recommended for a time allowance for the average root canal operation.

Dr. Custer suggested the use of a mild electric current (from 2 or 3 dry cells) to inform us when we reach the apical foramen. When one electrode is introduced into the canal moistened with alcohol, and the other is held in the hand of the patient, the needle on the millampremetre is not affected but on reaching the apical tissues beyond the foramen it is immediately deflected.

The average length of a central root is 21 millimeters a lateral 22, a cuspid 24 and a bicuspid 20 millimeters. By having short broaches, these lengths indicated by 1, 2, 3 or 4 grooves in the handles and using these in the canals for radiographing the apical foramen may be readily located.

PORCELAIN AND GOLD INLAYS BY INDIRECT METHOD.

Impression of cavity is taken by Kerr compound in form of cones. Sheet tin 3-1,000 inch thick is used as a matrix. In bicuspid and molar approximal cavities, a small strip of tin is placed between the teeth and bent backwards over the occlusal surface of the tooth adjacent to the cavity then the two ends of the tin band between the teeth are bent around the outer margins of the cavity to form a box into which the softened impression compound cone is forced. Be sure to pack wet cotton in between the cervical edge of the matrix and the adjacent tooth to prevent the tin being forced beneath the underlying wall of the adjacent tooth. The impression is cooled and removed either alone or with the matrix and trimmed down to regular lines so as to have a more or less regular base. Thin wax is wrapped around it and it is sunk into soft plaster in a wax or rubber ring. An amalgam model is now made in the same way as for porcelain crowns. Then gold may be burnished into amalgam model or be swaged into it, to get gold matrix. The following steps are used in burnishing a platinum matrix:—

1. Wet cotton is forced down against floor of matrix with match.
2. Cotton tape stretched over matrix and cotton.
3. Burnish matrix with bare instruments (Reeves Burnishers).
4. Turn or roll over edges of matrix to form collar for stiffening.
5. Annealing and burnishing with rubber tape (surgical tape or inner tube of tire may be used). Wet surface of rubber and when stretched over matrix burnish to place.
6. Paint edges of platinum matrix with shellac to prevent charring of edges by porcelain when baking.

PREVENTIVE DENTISTRY.

Demonstration of importance of normal occlusion and normal contacts in the healthy condition of the gums and peridental membrane.

Suggested use of 5 per cent. Normal Salt solution as a mouth wash also use of Sodium Bicarbonate solution in warm water to relieve sensitiveness of cervical margins.

One drachm of Zinc Phenol Sulphate dissolved in 16 ozs. of U. S. P. antiseptic solution also makes good mouth wash.

Tricalcium Phosphate probably least abrasive base for tooth powder.

By dissolving lead, in Faber ink pencil, in water a more permanent disclosing solution can be made than Skinners Iodine solution which soon washes off.

Alphazone prepared by Parke, Davis Co., was recommended for bleaching and removing stains.

Very fine sifted flour of pumice; 3X Silex and Oxide of tin moistened with Phenol Sodique applied with orangewood sticks was advised for polishing teeth.

Alpine wood sticks recommended to patients along with ribbon floss.

PORCELAIN CROWNS.

Prepare molar root end (or other tooth) with cutting burs and stones, dressing down in line with gum and cutting pulp chamber so that the walls are parallel or slightly divergent, also open canals with tapering instruments so as to allow inlay wax to be forced into them to a depth of about one-sixteenth or a quarter of an inch, and yet be readily withdrawn. Cast a slightly pyramidal shaped core out of pure silver (not coin silver) using two sprue wires and cement to place so as to leave a narrow ledge of tooth same width all way around.

JACKET PORCELAIN CROWNS.

Where natural crown is badly broken down it was recommended to cast a pure silver core in shape of cone, and cement it to place in pulp chamber.

Select a copper band, slightly larger than the root circumference,

and take an impression with Kerr's stick compound, not softening the core of it, and shoving steadily to place.

Wrap copper band impression with this wax (Kerr's), and sink into ring of plaster, using either wax or rubber ring. Immerse in warm water and remove compound and copper band, then pack with some cheap amalgam. First use amalgam containing excess of mercury, afterwards packing in dry amalgam and removing excess of mercury. Cut slot in buccal side of base of amalgam model (for accurate seating in articulator), make a tin (gauge 40 or 3-1000 inch Crescent tin, Consolidated Co.) matrix and a 1-1000 platinum matrix, using orangewood stick for burnishing. Cover tin matrix on model roughly with cement, trimming to shoulder. Transfer to mouth and take compound impression with cement seating jacket in place. Now set amalgam model into the compound impression of cement seating model. Insert ordinary pins into cusps of adjacent teeth in compound impression and fill the cusps with cement, then pour with plaster.

Take impression of opposing teeth in mouth with compound, chill, oil surface, and pour with Spence's metal. Roughly burnish tinfoil over biting surfaces of upper and lower models, transfer to mouth, get patient to close into opposing tin, and carefully stick them together, while in correct occlusion, then insert cement and Spence metal models into them and transfer to a Kerr crown articulating form. This method produces a perfectly accurate articulation with indestructible occluding surfaces.

Build base plate wax around collar of platinum matrix below shoulder and surround with paper telescope and pack in basic porcelain body mixed very thin, and dry with Japanese bibulous paper, now build in lighter shade, and trim to a cone shape. This is now ready for the first baking.

INLAYS.

A very satisfactory and accurate method of mounting amalgam model and articulator on a detachable articulator, designed by Dr. Spaulding, and manufactured by Kerr, was demonstrated.

By using this articulator frame the model is easily removable to work upon. Contact points are accurately obtainable as well as correct articulation. Several cases can be prepared and articulated on the same frame, as all the parts are interchangeable.

The indirect method seems particularly applicable to any cavity which involves a contour or where a matrix is necessary in getting the impression. For occlusal cavities, and in fact for any four-walled cavity it is difficult to see why the direct method is not much more desirable.

ARMY DENTISTRY

By authority of Lt.-Col. Thompson, A.D.D.S., M.D. No. 2
This Department is Edited by Harry S. Thomson, Captain C.A.D.C.

- ¶ *The unselfish and efficient work of the Canadian Army Dental Corps is not yet fully understood or appreciated either by civilian dentists or the public generally.*
- ¶ *Public appreciation and recognition of Dentistry, during the period of the war, certainly depends more upon the ideals and accomplishments of Army Dentists than upon those of civilian practitioners.*
- ¶ *The Dental profession and the Dental Corps are not distinct bodies. Their interests are identical. The one is part of the other.*
- ¶ *In the conduct of this Department, Captain Thomson will be glad to receive assistance from all who are willing to help, and will appreciate receiving personal notes, suggestions, or manuscript describing interesting cases in Army Practice.*
- ¶ *Address communications to Captain H. S. Thomson, C.A.D.C., North Toronto Orthopedic Hospital, Toronto.*

Our Introduction

AT the annual convention of the Ontario Dental Society one of the speakers suggested, and it was heartily endorsed by those present, that an Educational Propaganda be instituted, covering the great work being done by the Canadian Army Dental Corps, and for this special purpose committees have been formed, of men high up in the profession, who are going to use the columns of this magazine, and various other means, to bring before every dentist in Canada the extent and importance of this great work, and we are going to ask you to co-operate with us in spreading this knowledge among your patients. In this way we think a great good can be done our profession, and also to the public in general. It is a wonderful thing what a properly instituted propaganda can do. The psychology of it is marvellous. First you read and are convinced that some particular object is good and worthy, you emphasize your conviction by telling someone else that it is good, and it gains in emphasis by them telling it again, and so the propaganda grows. This has been many times demonstrated during this war, and now we are going to try it out on our own profession. The old law which is as definite as it is old, says that: Whatsoever a man soweth that shall he also reap. So let us take the greatest care in the preparation of our soil and the fertility and soundness of our seed, and then sow just as much as we dare, and the harvest will be bountiful.

The ordinary layman thinks that the army dentists' duties are solely to extract teeth, stop toothache and do temporary work. Not only do the laity think this, but a large majority of our own profession have a very vague idea of what we are doing, and the absence of literature on dental work during the war is a mark of it. This is a deplorable fact, and should be remedied at once. Steps must be taken to acquaint them at regular intervals of the work done in

the corps, and all work of educational value to the public should be published in the daily press. Now, after three and a half years of war, we have something definite to write and talk about; tangible facts to show proof of positive results in extreme cases. The publicity given to the work done by the Army Medical Corps is an example of what might be done. Our own work is just as important in its own field, and we need not feel ashamed to draw the attention of the entire world to it.

For a long time dentistry has been more or less undefined. We hardly knew what we were: craftsmen, artisans or mechanics, but of late years a decided change has taken place, and we have been forced to take a position well up among the sciences. In order that we keep pace with the scientific advance of the time, we have had to change our methods, and the dentistry of to-day is no more like the dentistry of twenty years ago than the present war tactics are.

This war has given us a great opportunity to bring home to the general public the great changes that have taken place in our profession, which we otherwise would not have had. When you consider that one out of every fourteen persons in the Dominion of Canada is at present in war services, and you realize that about ninety per cent. of these will come in contact with the Army Dental Corps, you can form some idea of the education it is going to give them along dental lines. Heretofore we have been educating the school children in Oral Hygiene, and they in turn carry the knowledge home to their parents, and in that way spread the gospel, but we are now coming in contact with the fathers and big brothers of these children, who, realizing the benefit which they have received from the proper dental treatment, are going to see that the family and those coming under their care are going to receive the same benefit to prevent serious consequences arising.

We would like you to understand that this propaganda that we are promoting is not to enlist any sympathy for the C.A.D.C., but just to enlighten you as to what we are doing. We feel that every dentist should know as much as possible about our work, that he should know just how many operations we perform in one month, and the nature of these operations; how many cases of facial restorations through plastic surgery and by prosthesis; how many definite cases of general systemic infection due to alveolar abscesses; how many cases of trench mouth, and just how we treat their different conditions. We feel that he should be familiar enough with our work so that he can tell his friends all about it. Tell each mother that has a son in the army the possibilities of him receiving the best dental care, and ask her if he is getting it. Tell your patients that the C.A.D.C. is one of the greatest organizations for good in the army to-day, and is one of the most efficient units in the system. And the work is, or should be, carried on by the very best men in Canada to-day. The state-

ment has been made that there are at present nineteen thousand medical men in the United States army, and forty per cent. of these are the most renowned and prominent physicians and surgeons in the country. This is a wonderful showing, and goes to prove that men are not considering financial loss or inconveniences, but are giving unselfishly of the very best that is in them to their country.

There never was a war in which the professions were called upon to take such a part as they have taken in this one. The chaplain service, the medical services, the dental services and the nursing sisters, and all have proved themselves indispensable. Dentistry, the youngest of them all, has taken no youngsters' part, but has kept right up to the front line, sometimes under difficulties, but carrying on just the same, and proving every day that dentistry, as preventive medicine, is one of vital importance to the health of an army. Col. Hendrie, who recently returned from France, stated in addressing an American gathering of physicians, that sound teeth are as essential in the army as sound limbs. Those coming in contact with C.A.D.C. are unanimous in their praise of the work they are doing. But we feel that too little is known about it, and for the purpose of giving more publicity, we want to enlist the interest and sympathy of every civilian dentist in Canada.

We are going to publish from month to month all figures and facts that we think would be of any interest, the amount of work we do, and as far as possible details governing the treatment of any special cases. Unusual cases will be given special prominence, and we will be glad to receive from you any suggestions or matter relating to dentistry in the army. Keep your eyes and ears open for anything that would be of interest. This will give you a good working knowledge of what is being done, then you will learn to talk about our profession, and just what part it is taking in this great war.

You will find that the public are anxious to hear about it, and it will not only broaden out your own ideas, but will scatter broadcast information that will surely be of great benefit, and encourage those concerned to carry on to even greater effort.

H. S. THOMSON,
Captain.

The Law of Compensation

THIS is a world of compensations. Emerson has said, that for everything you have missed you have gained something else. How true that is of the change that has taken place in us as individuals during the past four years! We have all suffered losses, some most terrible, others only financial and mental, but all have been

sacrificing; but have we really stopped to consider what we are gaining to compensate us for our losses? We have gained a broader outlook on life, a more fervent faith in the ultimate victory of right, a tolerance for the shortcomings of others, and I think the most important of all, we have ceased to look at things from our own selfish view alone and have given generously of our time and ability to promote and work for the other fellow's good. This has been exemplified in our own profession, in the organization of the C.A.D.C. At the beginning of the war, we all thought it would be of short duration, and many of our better men decided that it was hardly worth their while to sacrifice their well established practices for the sake of performing a service for a few months that a younger or more recent graduate would do without making any sacrifice, and at that time we also thought that the work done in the C.A.D.C. would be largely temporary, to make men fit for service for one year at most. But as the months advanced into years a great change has taken place in the minds of some men. They seem to see what an opportunity they were losing to be doing a wonderful service for humanity and for dentistry, for it is clear now that never before, and we hope never again in like manner, will such an opportunity be offered for the dentist to give of his best professional skill and also the best of his own personal characteristics. Could any work be nobler than that of making fit for service, men that were incapacitated through lack of dental services? Could any work be nobler than that of making fit to return to civilian life, men that have been maimed and disfigured in this awful war? Talk about compensation, there is no compensation greater than that of making it possible for a man to go back into civil life, after having ugly scars made less unsightly, and having restored lost parts of the face and jaw, so as to bring it as nearly as possible to normal. No personal loss can compare against the gratitude and appreciation for those to whom it has been your privilege to render such service. The members of the C.A.D.C. are doing this service every day, largely overseas, but a great deal of it is being done also in our hospital clinics in Canada. Bone graft has restored almost all of lower jaws, and very many to restore smaller parts. Noses entirely and in part have been successfully restored, and in some cases involving parts of the cheek. Dentures and bridge work have been supplied to build out and make less displeasing fearful scars. Metal and vulcanite plates have been made to cover wounds involving loss of large parts of the skull. Faulty unions of fractures have been corrected so as to restore masticating service. Some of these cases necessitated a new fracture being made, and so very many cases of vulcanite and metal dentures being inserted to restore the teeth lost, jawbone tissue and the teeth. All of this is being done every day in Canada by members of our C.A.D.C. in the various

returned soldiers' hospitals, and think how much more of it is being done in France and England.

If we could only make you understand, too, how much this is all appreciated and how grateful these men are for these services, you would then understand that no loss, financial, professional or any other, compares with the compensation we receive in being able to make it easier for some of these men to carry on, both in the army and afterwards out of it. And can't you understand what all this is going to mean to dentistry? It is going to raise it up to second place only with the A.M.C., from a humanitarian standpoint. We recognize the great work the medical men are doing, but we feel that we are following along in a close second place. And in a rapidly growing number of cases they are finding us indispensable in carrying on their great work. Dentistry, therefore, in this awful war is being given an opportunity to make good and prove itself, and we want everyone to know that we are making good, and the man who is giving the best that is in him, whether he is in the corps or out of it, is going to be made a nobler, bigger, and stronger man, and is doing something for his profession that can only be done through sacrifice, for as Carlyle says: Everywhere in life the true question is not what we gain but what we do.

C.A.D.C. Officer's Method for Sterilization of Modelling Compounds

REPORTED BY W. E. CUMMER, D.D.S., TORONTO.

DURING an afternoon's visit to that section of the Canadian Army Dental Corps with headquarters at Winnipeg, afforded by Lieut.-Col. W. W. Wright, the writer was fortunate to witness, among many other details of absorbing interest, a process heretofore entirely unknown to the dental profession, to wit, a practical and effective method for sterilization of modeling compound. The credit for this process rests with Quartermaster-Sergeant A. J. Saich, C.A.D.C., who in civil life is an articulated dental student of the Province of Saskatchewan. His instructions here follow:—

INSTRUCTIONS RE STERILIZING COMPOUND.

"1. Thoroughly clean all plaster from compound, breaking any "extra large pieces of compound so that there are no pieces larger "than an egg.

"2. Place in a pot, a double boiler is preferable, as it prevents "the compound from burning at the bottom, and cover well with a "solution of Glycerite of Naphthol (Benetol) composed of one ounce "to one gallon of hot water.

"3. Bring to a boil as rapidly as possible and boil 30 minutes.
"Note. Be sure water is really boiling, as the small pieces of plaster
"left in the compound will cause numerous bubbles to rise.

"4. Pour water off and pour compound out, which should be a
"spongy mass, on a sheet of galvanized iron, or clean planed board,
"previously covered with Russian oil.

"5. Knead thoroughly the same as dough, when plaster that may
"have been left in will work to the surface in the form of a bubble.
"Be sure to keep hands well covered with Russian oil to prevent com-
"pound from sticking and start kneading as soon as it can be handled.
"Do not use soap and water to prevent compound from sticking as
"the lye in the soap will destroy the oils in the compound.

"6. As soon as the compound begins to show signs of stiffening,
"roll out on oiled surface and just before hardening run a knife
"across same, marking off squares of desired size."

"An excess of Russian oil incorporated in the compound will seriously retard its setting qualities. An excess of oil may be extracted by again bringing the compound to a boil. Only enough oil should be used to keep the compound from sticking to the table and hands."

A sample of the Detroit modeling compound treated in this manner was handed to the writer and appears to have a physical appearance and behavior almost identical with the original material. Bacteriological tests conducted with the treated material at the King Edward Hospital, Winnipeg, have been found sterile.

The writer is happy to share the pride which the civilian profession feels in the splendid work of the C.A.D.C., both in the field and in the matter of research work peculiar to the military side of dentistry.

And He Was Drafted

A MARRIED man of draft age who couldn't read, asked his wife to write a note to the exemption board stating the family was dependent upon him. Here is the note that the wife wrote and the husband presented to the board:

"Dear United States army—My husband ast me to write you a reckomend that he supports his fambly. He cannot read, so don't tell him, jus take him. He ain't no good to me. He ain't done nothing but drink lemmen essence and play a fiddle since I married him eight years ago, and I gotta feed seven kids of hisn. Maybe you can get him to carry a gun. He's good on squirrels and eatin, take him and welcum. I need his grub and his bed for the kids. Don't tell him this, but take him."

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, JUNE, 1918

No. 6

EDITORIAL

Reciprocity in Dental Licenses Between the General Medical Council and Canadian Provinces

DURING the past year the Director of Dental Services—Canadian Army Dental Corps—overseas, entered into negotiations with the British Dental authorities regarding some measure of reciprocity of dental licenses between Canada and Great Britain. These negotiations apparently had in view a plan of reciprocity involving the Dominion Dental Council. The suggestion was made that the Dominion Dental Council present D.D.C. certificates to Canadian licentiates serving in the overseas forces.

About six weeks ago the Winnipeg Dental Society unanimously passed a resolution urging that dentists who have given at least six months of satisfactory service in the C.A.D.C. or other branch of the British Expeditionary Force, be granted the privilege, upon discharge, of practising their profession in any province of Canada; and for the purpose of carrying this plan into effect, it was urged that the Dominion Dental Council grant certificates to all such candidates upon payment of regular registration fees and fulfillment of the Council's ethical requirements.

The difficulty with these suggestions appears to be that the Dominion Dental Council is not a licensing body. Members of the Dominion Dental Council have frequently expressed the view that exchange of licenses is a matter for consideration by the licensing bodies of the several provinces of the Dominion, rather than by the Dominion Dental Council itself. This view was also adopted by the Board of Directors of the Royal College of Dental Surgeons of Ontario at their recent annual meeting. The Board instructed the superintendent to enter into correspondence with the British authorities regarding dental reciprocity with Ontario. It was decided that the matter should be approached from the broadest possible standpoint and should include all eligible licentiates whether holders of the D.D.C. certificate or not, and whether engaged in either military or civil practice.

The following was suggested as a suitable basis upon which negotiations might proceed:—

First: That reciprocity of Dental Licenses between the General Medical Council and the R.C.D.S. be limited to ethical licentiates, who have obtained a license by virtue of the successful completion of a regular, recognized dental course, attended in its entirety, in either Ontario or Great Britain.

Second: That applications of licentiates of either Ontario or Great Britain, who have given six months or more of satisfactory service in the Canadian or British Expeditionary Force, and who are unable to conform to the first paragraph above, be given individual consideration by the licensing board before whom such application comes.

Should these negotiations be successfully concluded between the Royal College of Dental Surgeons of Ontario and the General Medical Council, it would doubtless prove a simple matter to extend the operation of reciprocity to other provinces of the Dominion that might desire such provision to be made.

Canadian Army Dental Corps—Dental Operations Performed

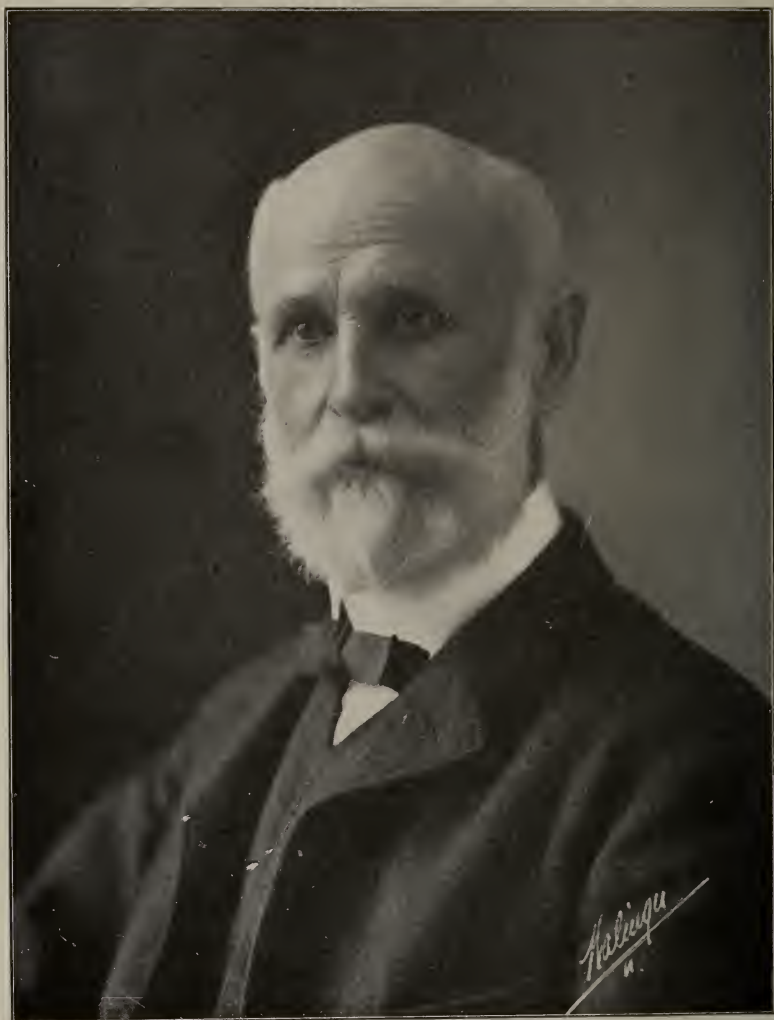
Headquarters, C. A. D. C.,
Room 45, Pembroke House,
133 Oxford St., London, W. I.
April 25th, 1918.

Dental Operations Performed by Officers of the Canadian Army Dental Corps in England and France from January 1st. to March 31st, 1918, and also Showing the Grand Total of Work Completed since July 15th, 1915.

Total operations Reported to:	Filling.	Treatments.	Dentures.	Prophylaxis.	Extractions.	Devitalizing.	Total.
Dec. 31st, 1917.	554,370	196,132	106,958	86,723	372,714	58,732	1,375,629
January, 1918..	27,655	13,082	4,643	7,543	10,142	2,516	65,591
February, 1918..	29,398	13,869	4,816	6,132	11,544	2,549	68,308
March, 1918..	27,561	13,971	4,373	9,623	11,160	2,298	68,986
Grand Total	638,984	237,064	120,790	110,021	405,560	66,095	1,578,514

J. ALEX. ARMSTRONG, COL.
Director of Dental Services, O.M.F. of C.

“*SCIENCE is a beautiful thing, undoubtedly, and of itself well worth all the labour that man may bestow upon it; but it becomes a thousand times grander and more beautiful when it becomes a power; when it becomes the parent of virtue. This, then, is what we have to do; to discover the truth; to realize it out of ourselves in external facts, for the benefit of society; in ourselves, to convert it into a faith capable of inspiring us with disinterestedness and moral energy.*”—GUIZOT.



Greene Hardiman Black

1836-1915

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, JULY, 1918

No. 7

State Dentistry*

FRED J. CONBOY, D.D.S., TORONTO.

IN discussing the question of State Dentistry, we are at once confronted with that time-worn question of man's duty to the state. There are, unfortunately, many who believe that the world owes them a living, and that they are justified in living on others, that they have a perfect right to grasp all they can and give as little as possible. On the other hand some countries, such as Germany, teach that the interests of the State are all important, and that the individual citizen is of no value, except in so far as he can be used to benefit the State. It would appear that in this question as in many others, the reasonable, sane course lies in the golden mean; the citizen certainly has individual and personal rights, and he is also under certain obligations and duties to his fellow-man or to the State. Whether we are willing to recognize the fact or not, we are, to a very large extent, our brother's keeper. That being the case, what is our duty to our fellow-men? Surely every citizen is under obligation to render to the State his best possible service. And how are we to render this best service? By the development of all our powers, physical, mental, emotive and volitional power or action.

Endurance. Now, what has State Dentistry to do with endurance development? State Dentistry means regular systematic inspection and the necessary treatment, with the consequent improved health and increased endurance. Eighty per cent. of all deaths are caused by infection, and eighty per cent. of all infection enters the system above the collar. The two factors which decide whether or not an indi-

* Address delivered at the Easter Conference of the Toronto School Dental Staff, April 2nd and 3rd, 1918.

vidual shall become the victim to a certain lesion or disorder, are the quality and quantity of the infection, and the resistance which the system offers to the invading organism. A clean, healthy mouth means a lessened quantity of infection and lessened virulence; good teeth mean proper mastication, proper mastication means good digestion, sufficient nutrition and increased resistance to disease. State Dentistry results in good teeth and a clean, healthy mouth, less infection, increased resistance, better health, maximum endurance and consequently greater service-rendering power.

Ability. How will State Dentistry increase the ability, and thus allow the individual to improve his service-rendering power? Physical health and mental health go hand in hand, diseases of the teeth are not only a great hindrance in intellectual development, but are also the cause of many other lesions, including diseases of the eye, ear and nervous system. To possess ability one must be able to think, remember and imagine well; to do these things accurately and well, we must sensate properly, but this is an absolute impossibility if the individual is handicapped by diseased conditions of the eye, ear and nervous system. Then again, if intellectual progress is to be made close concentration is essential, but how can an individual concentrate, if the body, through which the mind functions, is racked with pain or poisoned with toxins? Many educational advantages are lost through absence from school, and such absence is frequently occasioned by diseased conditions of the teeth.

Recent investigation has proven that inability to properly use the jaws in mastication results in sub-normal brain development, and that the pressure upon a nerve, caused by an impacted tooth, has led to mental abnormality; this proves how closely the physical and mental are related.

Dr. Luther H. Gulick, of New York, is responsible for the statement that of 400,000 children examined, those with two or more bad teeth averaged five months behind the grade they should occupy, and observations in connection with Toronto schools bear out this contention. The old saying, that if a pupil is to make the best of his educational advantages, he must have a sound mind in a sound body, is just as true to-day as it ever was. It is a psychological impossibility to have a one hundred per cent. power to think, remember and imagine unless the mind has a sound body through which to function. True, there are examples in history of great minds operating in weak bodies, but it is also true these minds would have been still better had they had strong bodies through which to work.

Reliability. The physical, mental and moral are intimately and closely related. That which injures one, to a certain extent weakens the others. Endurance, ability and reliability go hand in hand. A pupil, physically weak, is handicapped in his intellectual development,

and a pupil, mentally weak, is handicapped in his character development.

The first requisite for character-building is right thinking. The pupil who continuously suffers pain and is handicapped by physical defects, has thoughts that are morose, gloomy and sullen, and these have a destructive influence upon his emotive power.

It is the child who, through some physical or mental defect, finds it impossible to hold his own in the class room, that becomes the truant. He soon begins to realize that he is a failure, and feels that the school authorities are oppressing and persecuting him, that everybody's hand is against him, and the moral disease of unreliability soon manifests itself, because the person, weakened by disease, is weak in will power, and more readily yields to temptation. The removal of a physical defect is often the first step in character-building.

Volitional Power or Action. There are two elements entering into volition: decision or choice, and action. To make a correct decision, one must be possessed of sound judgment, must be able to weigh matters, must see them in their true light, therefore must have good physical and moral health. To place these decisions into successful action, ability and endurance are absolutely essential.

In summing up this phase of the question, we contend that it is the duty of every citizen to render his best possible service to the State; to do this he must develop all his powers; that is, his endurance, ability, reliability and action. As we have pointed out, State Dentistry will materially help in this development, therefore every citizen should demand such a system so that he may have an opportunity of having his mouth properly and regularly inspected, and the defects corrected.

Now, let us look at this question from another viewpoint. Why has the State a right to insist upon every citizen putting his mouth in a healthy condition?

In the First Place because no man lives unto himself; whether we recognize it or not, we all have an influence upon our fellows. If a man could suffer for his own neglect, without causing trouble and expense to others, he might try to justify that neglect. But such a thing is impossible, and no man has any right to cause trouble, worry and expense to others; no man has any right to spread infection; no man has any right to hand down to his children a lessened resistance to disease, and consequently the State has a right to expect every citizen to properly care for his teeth and is in duty bound to place at his disposal the means for so doing.

In The Second Place the State has a right to demand efficiency; she must do so, if we are to hold our own among the nations of the world. But we cannot have efficiency without health, and we cannot have good health if suffering from diseased teeth. In order to increase the efficiency of its citizens, the State demands compulsory education,

and is justified in so doing, but if the child is forced to attend school, he should be so protected while there that his health will not be endangered.

In The Third Place the State has a right to demand economy; she must do so if we are to survive this terrible conflict. We must conserve our man power. The work of every man is needed, he must not be sick and unable to work, he must not die a premature death, his services are required. Every child must be trained, and so must be in such a condition of health as to be able to take the very best possible advantage of his educational opportunities.

We must conserve our equipment power, no machines should be allowed to stand idle because the operator is suffering from a preventable illness. No school seats should be empty, when proper inspection and treatment would keep the children healthy and able to attend school regularly, thus saving the country that large amount of money spent upon repeaters.

We must conserve our equipment power, no machines should be having large dental operations performed, when, under a system of regular inspection, the defect would have been discovered early, and could have been corrected by a small, inexpensive operation, thus saving the patient's time, money, tooth substance and pain. A large amount of money is wasted in the treatment of disease the direct result of Dental lesions.

In The Fourth Place it is essential to the State that all her citizens live a happy, prosperous, contented life, and yet what pain, sickness and poverty are caused directly and indirectly by dental disease!

Therefore, we contend that the State has a right, and that it is her bounden duty, to establish an efficient system of State Dentistry.

Now, what are some of the objections that have been raised? The claim has been advanced by some objectors, that a man is master of his own home, and the State has no right to interfere. This contention has already been disproven. Others affirm that State Dentistry will remove the proper responsibility from parents, but such is not the case. The results in connection with the Toronto system prove that parental responsibility has been increased rather than diminished. Formerly the people were ignorant of conditions, and consequently could not be held responsible. Now they are informed, and cannot escape their obligations. Some object on the plea of cost. Many industrial firms have engaged a dentist, and equipped a clinic at their own expense, and find that it pays better to keep their employees in good health than to allow their work to become disorganized through absence and inefficiency. Add to the industrial loss, the loss in the home through sickness and other concomitant expense, the loss in the school and the actual loss in being forced to have larger and more expensive operations performed, and you will find that it would pay many times over to have an efficient system of State Dentistry.

Announcement National Dental Association

THE National Dental Association will hold its Twenty-second Annual Meeting in Chicago, August 5-9, 1918. The headquarters will be at the Auditorium and Congress Hotels, situated on Michigan Avenue, corner Congress street. All meetings, clinics and exhibits will be held in these two hotels, which are connected with an underground tunnel.

The important announcement at this time must be the warning "RESERVE YOUR ROOMS AT ONCE. MAKE RESERVATIONS BY MAIL DIRECT TO THE HOTEL OF YOUR CHOICE."

The following is a list of hotels and rates:

Auditorium Hotel, Michigan Boulevard and Congress Street.

Single room without bath, \$1.50 and \$2.00 per day.

Single room with bath, \$2.50 to \$4.00 per day.

Double room without bath, \$2.50 and \$3.00 per day.

Double room with bath, \$4.00, \$5.00 and \$6.00 per day.

Congress Hotel and Annex, Michigan Avenue and Congress Street.

Room, detached bath (one person), \$2.00, \$2.50, \$3.00 per day.

Room, private bath (one person), \$3.00, \$3.50, \$4.00, \$5.00, \$6.00 per day.

Room, detached bath (two persons), \$3.00, \$4.00, \$5.00 per day.

Room, private bath (two persons), \$5.00, \$6.00, \$7.00 per day.

Suites: Two connecting rooms, private bath (two persons), \$6.00 to \$10.00 per day.

Three or four persons, \$8.00 to \$14.00 per day.

Corner suites: Parlor, bed room and private bath, \$10.00 to \$50.00 per day.

General Clinic.

Arrangements are sufficiently advanced to promise the members of the Association that the General Clinic will be one of the great features of the 1918 meeting.

In conference with officers of the National Dental Association, the Committee in charge of the General Clinic carefully considered the nature of the clinic to be presented this year. After trying for the past few years new features in conducting the Clinic Program, it is the belief that a greater number will be served and benefited by holding a General Clinic, grouped into sections: Namely—Operative, Prosthetic, Crown and Bridge Work, Orthodontia and Prophylaxis.

To make it National in character, the Presidents of the different State Societies, were requested to appoint two Clinicians and two associates from his State Society.

Up to date, thirty-nine State Societies are represented, and the remaining nine will be represented before the publishing of the Official Program.

Far away Alaska is sending two and two associates, and to make the Clinic more than National, in fact an allied affair, the Canadian Dental Association has promised ten of the best Clinicians in the Dominion. In addition, there will be a few Unit Clinicians which will demonstrate principles that require more than two men.

It is safe to say that this Clinic will be unique in the sense that every man on the program will either be present or be represented by his associate.

PROGRAMME

HOUSE OF DELEGATES—MONDAY, AUGUST 5.

The registration office for this great meeting will be open Monday morning at 8.30. The delegates to the House of Delegates will present their credentials and be seated at 10 a.m. This will be the big official business day of the meeting.

SEMINAR—THE MANAGEMENT OF PULPLESS TEETH—TUESDAY, AUGUST 6, 9.30 A.M.

Six of the best known scientific research authorities will submit "evidence and not opinions" on this subject.

THREE SECTION MEETINGS—TUESDAY, AUGUST 6, 2.00 P.M.

The section on Prosthetic Dentistry and Crown and Bridge Work will render a programme on "Occlusion and Variable Occlusion" and "A Scientific Technic in the Construction of an Artificial Denture."

The section on Oral Surgery and Anesthesia will present a programme on "Cleft Palate and Harelip Procedures" and "Recent Progress in the Management of War Injuries of the Face and Jaws."

The section on Orthodontia and Periodontia have arranged for the following programme:

"A Classification of Pathological Conditions of the Mouth."

"Physiological Factors as Related to the Periodental Membrane, Cementum and Bone in Tooth Movement."

"Orthodontic Appliances and Gingival Tissue."

"The Histology and Development of Cementum."

"The Duty and Responsibilities of the Orthodontist in the Present War."

"The Necessity for Orthodontic Interference in Malocclusion of the Teeth."

MILITARY DENTISTRY—WAR SURGERY—TUESDAY, 8.30 P.M.

The speakers at this session will be surgeons of National and International reputation.

UNUSUAL SECTION PROGRAMS—SIX SECTIONS AND ORAL SURGERY CLINICS—WEDNESDAY, AUGUST 7.

9 A.M.—The sections on Operative Dentistry, Materia Medica and Therapeutics—Organization, Mouth Hygiene and Public Service—Research—The Preparedness League of American Dentists and General Oral Surgery Clinics will each present their programs

in various rooms in the Auditorium and Congress Hotels.

2 P.M.—The sections on Prosthetic Dentistry and Crown and Bridge Work—Oral Surgery and Anesthesia and Orthodontia and Periodontia will hold their second session Wednesday, at 2.00 p.m.

CANADIAN DENTISTS, OUR GUESTS—WEDNESDAY, AUGUST 7,
8.00 P.M.

How fitting it is, when the young men of the allied countries are freely and willingly giving their lives in the terrible conflict which is absorbing the attention of the entire world, when men and women of every station in life are making their first business the winning of the War, that the dentists of Canada and the United States should unite in holding their National meetings. The Canadian Dental Association will be the guests of the National Dental Association at this meeting and the program for the Third General Session for Wednesday evening will be furnished entirely by this Society. In the United States we have long since learned to follow the advice of Ruskin when he said:

“Gain all the knowledge you can;
Then use it for the highest purpose.”

INTERNATIONAL GENERAL CLINIC—150 CLINICIANS—THURSDAY, AUGUST 8, 9.00 A.M.

Clinics will be given by members of the Canadian Dental Association, representatives of forty states, and Alaska—Unit Clinics, Special Clinics on Root Canal and Crown and Bridge Work.

LUNCHEON TO OUR EX-PRESIDENTS.

Former Presidents of the American, Southern and National Association to be the guests of the Association at a luncheon in their honor by the members of the profession, who desire in this small way to show their appreciation of the valuable services they have rendered the profession and also to pay a just tribute to the Founders and Builders of Organized Dentistry.

DEDICATION OF THE BLACK MEMORIAL MONUMENT—THURSDAY, AUGUST 8, 2.00 P.M.

It has now been almost three years since the dental profession was deeply grieved to hear of the death of Doctor G. V. Black. Those who were present at the Panama Pacific Dental Congress at San Francisco will never forget, when his death was announced just at the opening of the Congress, how the cloud spread over that vast audience. In matters pertaining to Dentistry, Dr. Black was easily the master. If the world misses him, as it surely does, how much more do we miss him? It was our pleasure and privilege to live with him, speak to him and feel free to consult him at any and all times. By his death, the dental profession has lost one of its most cherished members; the world has lost a benefactor. All that was needed to erect a monument to his memory was for some one to say the word. That word has been said, and dentists from nearly every state in the



A Memorial from the National Dental Association, to be dedicated at the Meeting in Chicago

Union, as well as from many foreign countries, have contributed to the fund for the purpose. What could be more appropriate, therefore, than to unveil the monument to this great man when the National Dental Association is holding its annual meeting in the city, where, during the last years of his life, he lived and worked.

PATRIOTIC SERVICE—THURSDAY, AUGUST 8, 8.00 P.M.

Men of International and National reputation will be on the program for this unusual meeting, men who are the recognized leading statesmen, surgeons and divines of this age. It is quite fitting in this great war crisis that the dental profession should show its patriotic spirit by pledging anew its loyalty and devotion to our country. The speakers on this occasion will give the members of the dental profession an opportunity to hear the best men of the day discuss the vital problems that have to do with the present and future of our Republic.

GENERAL SESSION AND SECTION MEETINGS—FRIDAY, AUGUST 9, 9.00 A.M.

The sections on Operative Dentistry, Materia Medica and Therapeutics, Organization, Mouth Hygiene and Public Service, Research, and the House of Delegates and the last general session will be the climax of this great meeting—an anniversary meeting, that will go down through the years as having established a new high water mark in the history of dentistry.

Is It Structure or Environment?*

BY C. N. JOHNSON, M.A., L.D.S., D.D.S., CHICAGO, ILL.

IT will be noted that this essay starts with a query, and it may be possible that it will end with one. The question relates to the difference of opinion still existing among the members of the profession as to whether the significant factor in dental caries is the character of the teeth themselves or the conditions which surround the teeth. In other words is it structure or environment? Much may be said for and against either proposition, and it is well that the profession study this matter more and more carefully till a final solution is reached.

This study must inseparably be linked with the manifestations of susceptibility and immunity in the mouths of our patients. We know from observation that the mouths of some individuals are very susceptible to dental decay, while others are practically immune. We also know that there is a great variation in the degree of susceptibility manifested at different periods in the same mouth. The question is does this variation relate to differences in the tooth structure, or is it due to differences in the environment which surrounds the teeth?

For a long time the opinion was quite prevalent that the varying manifestations of dental decay were due to a resistance or a lack of resistance on the part of the tooth tissue; that some teeth were "harder" than others and resisted the active agents of decay, while others were "softer," and thus succumbed. For the time being the fact seemed to be overlooked that in the various chemical analyses that were made of the teeth by different men the percentages of organic and inorganic material ran along with astonishing uniformity, that there is very little variation in the chemical constituents of the teeth of different individuals; and moreover that what little variation there may be seems to have almost no relation to the susceptibility or immunity of any mouth.

This question of "hard" and "soft" teeth is a very natural one, and it is easily explained. Dentists in operating on the teeth discovered that in some instances the tooth tissue would break down quite easily under cutting instruments, while in others it was stoutly resistant. The natural inference was that in the one instance the teeth were soft and in the other they were hard. This idea planted itself in the minds of dentists, and from them it found lodgment in the minds of patients. In its practical bearing it proved a very disastrous theory to promulgate. It gave the impression to many people that their teeth were too soft to be saved by filling, and they were accordingly frequently condemned to the forceps, when a conscientious

* Read before the Odontological Society of Chicago, Feb. 5, 1918.

tious effort on the part of the dentist and patient would have saved them.

A careful observation of the phenomenon presented by the difference in the behavior of teeth under cutting instruments will reveal the fact that this difference is confined for the most part to the enamel, and that it does not relate to any variation in the chemical constituents of the teeth, but to the mere mechanical fact of the difference in the arrangement of the enamel rods. As every one in the profession knows, the enamel rods stand with one end resting on the dentin and from this radiating out toward the external surface of the crown of the tooth. It is the particular manner of this radiation that controls the resistance or lack of resistance of the enamel to cutting instruments. In some instances the rods radiate in a straight, regular, and almost parallel manner; while in others they pursue a wavy irregular course; this difference in the arrangement of the rods making the difference between enamel which cleaves easily and that which resists the instrument. It is well illustrated by the homely example of the difference between splitting straight-grained maple and bird's-eye maple. Every boy brought up in the country knows what a joy it is to split straight maple as compared with the grief attached to the attempt to split bird's-eye.

In breaking down enamel overhanging a cavity with a chisel it will be found that the enamel cleaves readily in line with the rods, but it is almost impossible to break the rods across. This proves that the strength of the enamel rests in the rods, and not in the cement substance which holds the rods together. In straight-grained enamel the chisel may be so applied that the enamel is cleaved away along the lines of the rods, thus separating them where they are cemented together without breaking off the rods themselves; but in the wavy variety this cannot be done. In order to break down wavy enamel it is necessary to fracture across many of the rods and this is what chiefly constitutes the difficulty in cutting such enamel. But the significant fact remains that if a chemical analysis is made of the two varieties of enamel it will be found that they are practically the same, and a matter of still greater significance is apparent in the fact that so far as susceptibility to decay is concerned the one enamel is as susceptible as the other. That is one enamel will take on the beginnings of decay as readily as the other, provided the environment is the same. Of course there may be a slight variation in the rapidity with which caries penetrates the two kinds of enamel. Manifestly the acid of decay cannot travel so rapidly down along the cement substance of enamel in which the rods are wavy and irregular as it can beside rods which are straight, but this does not alter the general fact that in a susceptible mouth both enamels are attacked with apparently equal facility. In other words there was never yet enamel laid down in the human mouth that would resist decay if

the conditions surrounding the tooth were favorable to the development of caries, while there are assuredly countless numbers of teeth in which the enamel would be found to break down easily if cut into, and which seem thin and frail in structure, but which remain free from decay for a lifetime.

Another consideration relates to a fact already referred to—that we note in the same mouth great differences in the tendency to decay of the teeth at different periods. All of us have noted this, a typical instance of which is a child with rapidly developing caries up to a certain age, when, if proper attention is given the teeth, there seems to be a cessation of the various process and the establishment of immunity. Then again, let this same patient later in life undergo some prolonged physical or mental tension, and the teeth are likely to begin to melt away with caries almost like snow before the summer sun. What is the reason? Is it because the structure of the teeth has changed so that at the one period they are more vulnerable to attack than at another? Do the teeth grow hard and resistant at one time, and soft and susceptible at another time? Is it not a fact that of all the tissues of the body the teeth are the least subject to change of any? In truth are we not told that the teeth are the only organs of the human economy which are not constantly being torn down and built up in the physiological processes of nature; that the teeth when once laid down and calcified in the jaw remain to all intents and purposes the same through life? Cut a piece from a muscle and nature will fill in the wound; break a bone and nature will proliferate new cells and mend the break, take a section from a nerve trunk and nature will restore that nerve to an incredible length, as has so frequently happened to the discomfiture of the surgeon and disappointment of the patient in operations for neuralgia.

But what shall we say of teeth? Fracture a cusp through the enamel and see if nature will restore that cusp. Not in a lifetime. Nature seems to have appointed the teeth as the one and only stable structure, not amenable to the same laws of constant change as are the other tissues. All of which points to the fact that when we see these varying manifestations of susceptibility and immunity to dental caries we are not logical in attributing them to changes taking place in the structure of the teeth themselves, but rather to changes occurring in the conditions surrounding the teeth—in other words to environment.

And this must be looked upon as a most fortunate circumstance. If decay of the teeth were due to the character of the tooth tissue the dentist would be helpless in the face of it. As has just been seen we cannot hope to change the structure of the teeth themselves, but we may hope to change the environment. And in this one direction lies the future promise of limiting, and eventually of preventing, dental caries.

By the foregoing it is not intended to convey the impression that the tooth remains wholly passive under the carious process, nor that there are not structural defects in the teeth which largely influence the formation of cavities. When a cavity begins in a tooth from whatever cause, and the dentinal fibrils are reached, there is an effort on the part of the pulp to protect itself by a deposition of calcareous matter in the pulp chamber at the point where the decay threatens; and if the approach toward the pulp is sufficiently slow it will be found that the pulp will recede indefinitely, all the while throwing out a deposit of secondary dentin to fill the pulp chamber at this point. This has been noted frequently in cases where the tooth has been worn down by mechanical abrasion, leaving the original outline of the pulp chamber clearly marked and filled with new tissue. This proves that so far as the pulp is concerned it is not inactive under the approach of caries, and to this extent it may be said to have some resistive function against decay, but it must be noted that this is confined to the pulp, and it is not operative till decay has actually started. It has nothing whatever to do with enamel nor to any resistance against the inauguration of caries in this tissue.

Then again we have structural defects in the tooth tissue due to faulty development, and in these defects we frequently find the beginnings of decay. Pits and fissures in the enamel left by a failure of the islands of calcification to coalesce and form a continuous covering to the tooth are often the seat of caries, and in this light the tooth structure may be said to be at fault. But two very significant considerations are worthy of note in this connection. We find that there are many mouths in which there is no decay even when these pits and fissures are present in the enamel, and not only this but in susceptible mouths we see decay occurring in surfaces of the teeth where there are no pits or fissures and no structural defects of any kind. We are all familiar with the fact that the proximal surfaces of the teeth are looked upon as the most vulnerable to attack of any, and we know that at this point the enamel is as perfectly laid down as any place on the tooth.

In the light of all this it must be obvious to any one that the significant factor in dental caries lies in the environment in which the teeth are placed rather than in the inherent quality of the tooth structure itself. This in reality is a most fortunate thing, because if ever we hope to control decay or to prevent it, we must do so through the medium of changing the environment rather than changing the teeth. As we have seen we cannot change the teeth after they have once been erupted, though we may well hope to change the conditions which surround them. And all the virtue from oral prophylaxis so far as limiting dental caries is concerned comes from this very thing. Those enthusiasts who have pro-

claimed that by oral prophylaxis they have improved the tooth structure and rendered it more resistant against decay have merely polished the surface of the tooth and made it so smooth that it is thereby more readily kept clean. This is a very important function to perform, and it is deserving of all praise, but the profession should not delude itself as to what actually happens. The polishing does not change the internal structure of the tooth—it merely places the surface in such a condition that external agents cannot act upon it with the same facility. It also removes for the time all those influences of environment which tend to act upon the tooth—the gelatinous material under cover of which the micro-organisms form their acid and attack the enamel. It takes away such mechanical irritants as deposits of all kinds, overhanging fillings, impinging edges of banded crowns, etc. All of these irritants tend to keep the surrounding tissues in an unhealthy condition, and it is the change in these conditions around the teeth by which the greatest value of oral prophylaxis is expressed.

Unfortunately at the present time it is difficult to state in exact terms what the significant factor in dental caries really is. We know, as has already been intimated, that one mouth is susceptible and another immune, but we do not know what particular agent or influence makes the difference. Various men from time to time have suggested various elements as the deciding factor, but no one to date has given us a working theory by which we could unerringly demonstrate susceptibility or immunity in a mouth. Miller proved, of course, that decay was brought about by the presence of an acid produced by micro-organisms, but micro-organisms may be found in every mouth, immune as well as susceptible. There is something aside from the mere presence or absence of micro-organisms which controls dental caries, and until we know just what this is we cannot proceed definitely or logically toward the task of eliminating decay from the mouth.

This does not mean that we are helpless in the presence of decay, and limited only to the make-shift expedient of filling cavities after they have occurred. It is true that many in the profession are doing this very thing in a wholly perfunctory and routine way, looking no further than the mere fact of a cavity and a filling. But modern dentistry can offer something better than this. While the effort to administer drugs to change a susceptible mouth to an immune one has not met with the success which its advocates had hoped, yet there are other means by which we may proceed to bring this desirable consummation about. We cannot stop the tendency to decay in all cases, but we can do so in many; and in every case we can, with the co-operation of the patient, work a very great improvement and keep down the decaying process to reasonable limits.

Resolved to its ultimate analysis it is merely a matter of cleanliness, and the intelligent practice of oral prophylaxis is the most effective means of bringing about cleanliness yet suggested to the profession. The judicious periodical removal of all gelatinous material from the teeth, the massage of the gums by the finger or tooth brush, the polishing of the teeth to keep the surfaces bright and glistening, and this kept up as a duty by the dentist and the patient will ultimately change the conditions in the mouth so that there will be a greatly lessened tendency to decay. This does not mean that it is justifiable for the dentist to promise the patient, as many are doing, that "a prophylactic treatment once a month will prevent decay"; nor does it imply that the term "prophylaxis" in this connection is a wholly correct one. It is even doubtful if this term should ever have been introduced, and used as the profession is using it to-day, because in many instances it is a misnomer. But the systematic plan of procedure as outlined under the head of oral prophylaxis presents to us at the present time the most promising means of limiting dental decay, and if this is true it comes very nearly answering the question at the head of this paper, "Is it structure or environment?"

Viewed in the light of what we now know, while the structure of the tooth may have some influence on the progress and rapidity of decay, the dominating factor in its incipency is the environment in which the tooth is placed.

DISCUSSION.

DR. JOHN P. BUCKLEY: Dr. Johnson has surely answered the question, and to me it seems he has answered it in such a way that he leaves absolutely no room for argument. He is a good deal like (I think it was) Louis Jack, of Philadelphia, who charged pretty good fees for his work. One day a fellow practitioner wanted to know of another one in Philadelphia why it was that Jack could command such large fees, and the reply was "He has the power of saying \$15.00 or \$20.00 in such a way that it leaves absolutely no room for argument on the part of the patient," and that is certainly the way Dr. Johnson has answered the question, "Is it Structure or Environment?"

I had no idea that a group of men as intelligent as I from the outside had supposed the members of this Society were, would have suggested such a subject for discussion, but Dr. Johnson said you had a discussion at a previous meeting as to whether it was structure or environment, and you failed to settle the question, and as a result he has written this paper. I am surprised in this day and age that you men should have an idea that the structure of the tooth had very much at least to do with the progress of decay.

It has been a number of years—nearly 12 or 15—since I gave the subject of chemistry and the decay of the teeth much study. Like

Dr. Hinkins, I used to go over it occasionally because it is a beautiful theory—the theory that a plaque can accumulate on the teeth, and that plaque, or gelatinous or mucoid material, can act like a dialyzing membrane beneath which bacteria are held, and these bacteria would die and starve to death were they not fed; but sugar, a soluble substance, comes along, dissolves in the fluids of the mouth, and osmosis or dialyzation takes place through the membrane and thereby feeds the bacteria, and the bacteria being fed splits the sugar up into an acid, and the acid newly formed being in an active condition lies there on the spot, concentrated as it is, not having an opportunity to become diluted with the fluids of the mouth, attacks the tooth structure, and when that process is over the bacteria would die again were it not for the fact of salt being produced, as a result of the action of the bacteria upon the inorganic structure of the tooth, is soluble calcium lactophosphate, and this dissolves in the moisture which is present, passing out again from beneath the plaque. Thus this process, going on and on, causes what is known as tooth decay. I like to go over the theory occasionally and kept it in mind because it is a beautiful chemical theory, and I believe it is correct.

Dr. Hinkins, the late Dr. Cook and myself, a number of years ago, spent one or two nights every week in the laboratory of the Illinois College on the subject of erosion, and we tried to disprove the theory of Dr. Kirk regarding calcium lactophosphate, which appeared through the polariscope as being crystallized in the mouth as a result of some acid acting on the calcium phosphate of the tooth, and we got into a great deal of trouble. If Kirk got as much fun out of this as Hinkins, Cook and I did, he ought to be satisfied, because I know we were.

As I said in the beginning, I have to wander more or less to say anything, as it seems to me, there was nothing left to discuss in the paper presented by Dr. Johnson.

I might say one thing more suggested to me by the paper, and that brings to my mind an editorial written by Dr. Johnson a month or so ago concerning which I wrote him a letter. In his characteristic way he called attention to the fads of dentistry, among which was the prophylactic fad, and Dr. Johnson in speaking of prophylaxis to be carried out in the mouths of patients by means of which the prevention of caries can largely be accomplished, has emphasized in that editorial that point, and in his paper to-night he has intimated that it should not be carried to an extreme. I would not permit myself to say that prophylaxis can cause as much harm as caries, but I do not hesitate to say here to-night that prophylaxis, as carried on by some men in this city of ours and other places, is doing a great deal of harm. That it is valuable no one can deny. That we can change by prophylactic measures and prophylactic processes the en-

vironment of the teeth, the condition of the mouth, is an assured fact.

DR. J. E. HINKIN: I am very much pleased to have heard Dr. Johnson's paper. He has rounded it out so beautifully and has spoken of environment and structure being so closely allied, that I do not know how to draw the line of demarcation between the two. It is a subject of considerable importance to-day and has been for sometime. But when we had a discussion a month or two ago it was largely on the analyses that have been made on all teeth, but it was very largely on qualitative analysis, and not quantitative analysis. I have never seen an analysis of any of the teeth, animal or human, but that it was qualitative and not quantitative. Therefore, it would be utterly impossible to make the statement and try to prove it that the chemical difference in the structure of teeth that we are studying is only qualitative and not quantitative.

We select a number of teeth which seem to us, from a clinical standpoint to be soft teeth, and we take another bunch of teeth which, from the same standpoint, seem to be harder from the point of view of the enamel, and then make an analysis of the two sets of teeth. This would be a very difficult problem and an exceedingly technical one. When we gather three or four quarts of teeth from the extracting laboratories and clean off the gum tissue and then analyze them for the percentage of calcium phosphate and carbonates and other things, we pay no attention to separating the teeth as to quality or quantity; we only want to find out the percentage of the elements in the teeth. It does not make any difference how diluted or concentrated it is when you start, it goes into one mass and you analyze it to the lowest constituent you can find as an element. If we had to make a quantitative analysis, we would have to go through a different process and take into consideration the laws of averages, which would tell us in a general way the fractional differences in these teeth. Of course, it would not be very marked.

I visited a couple of laboratories and selected about 100 teeth that had been extracted and had been thrown into jars. I took these teeth and put them into a solution of bicarbonate of soda, or similar solution, then took them out, cleaned them, examined them, and they looked like a soft variety of teeth. I then took these teeth to the chemical laboratory of the University of Chicago and went over them. A number of these teeth were children's teeth. We tested them as to their density and specific gravity, and the structure of these teeth averaged up very well with the law of averages as they use it. They said everything differs under different environment.

Dr. Johnson laid so much stress on environment that it is hard to tell where to draw the line of demarcation between structure and environment. If a child is put under proper environment and has got good, rich red blood corpuscles, and plenty of fresh air and sun-

shine, those things in part go to build up the structure of the teeth and that is part of environment. On the other hand, we know that some children who are poorly fed, poorly nourished, who live in badly ventilated homes have splendid teeth. What kind of environment would you call that? You find good teeth and good tooth structure, so structure and environment are closely allied, making it hard to differentiate between the two.

I said to Dr. Barrows that I would like to take this subject up and make a chemical study of it if I could have the co-operation of their laboratory. They said, all right, you can bring the teeth here and we will do all we can to help you settle this problem; but they said, "where to draw the line between structure and environment of teeth, we do not know. You have to find that out."

DR. P. J. KESTER: It seems to me, Dr. Johnson has covered the subject very effectually; but Dr. Hinkins' remarks rather puzzle me, because he took the view that the structural condition of the tooth depends upon its environment, which is probably true in a sense. In other words, in healthy, well nourished children's mouths, the probabilities are that the structure of the teeth is much better than those of children who are ill nourished, ill fed, and are not so well cared for.

I have had it in my mind to read a paper which will express to a certain extent my ideas in regard to immunity in decay of teeth. I have believed for a long time that this immunity to decay in the mouth depended more upon the condition of the patient than upon environment. I have thought for a long time that the fluids of the mouth contained within themselves certain morphological elements which controlled the decay of teeth.

DR. JOHNSON: Is not that environment?

DR. KESTER: No; that is physiological. Everything is environment. The air we breathe and our very existence are involved in the question of environment, but I am speaking now of a definite something which renders the teeth immune to decay. In speaking of environment and decay of the teeth in certain mouths, Dr. Johnson mentioned cases where decay is absent in those mouths that are ill kept, that have received little or no care, whereas in the mouths of patients whose general conditions are not above the average particularly, there is no appearance of decay of the teeth, so that in such cases the broad term environment, unless you include natural immunity, does not count.

DR. F. E. ROACH: I wish Dr. Johnson would explain what he means by environment.

DR. JOHNSON: The conditions which surround the teeth or tooth, rather than the tooth itself.

DR. ROACH: The term environment to me may mean a great deal. If we look upon the question of immunity and susceptibility of

teeth to take the decay as to whether these conditions are due to the structural makeup and integrity of these teeth, there is to my mind a difference in the chemical composition of the teeth. While the chemical composition of the teeth may not be sufficiently variable to be detected, the vitality or arrangement or integrity of that tooth, due to the inherited structural arrangement of the parts that constitute that tooth, seem to go more towards the resistance to decay or susceptibility to decay than anything else, and not so much upon the immediate surroundings or the environment, as I understand the term environment.

As to whether these teeth are bathed in secretions that are the average normal secretions, or whether these mouths are full of filth and are ill kept or not, we have seen many cases of mouths that had absolutely no care at all, and while their teeth did not look to be particularly strong, they have gone through life without any decay. Of course, it is evident that it is due to something there in the nature of environment, whether you limit the environment to the immediate surrounding conditions, or whether you mean by environment the vital resistance of that individual.

I do not think we know anything more about the reasons or causes for immunity and susceptibility of nature than we know about erosion. We are just as far at sea as we are about erosions. I do not think we know anything about it.

I am quite satisfied that what little we can do, so far as our immediate tinkering in the way of repair of these teeth and the cleansing of these teeth are concerned, is a mere infinitesimal effort as compared to what can be done, and I was in hopes the other night when Dr. Tinker presented a paper he would go right back to the beginning and tell us to put into the makeup of the individual from the very inception the elements that go to bring about that vital resistance the individual needs and the individual shows, not only to decay of the teeth, but of other diseases all through life, and it is that vital resistance we would like to get into these individuals that will make them resistant to caries.

It is amusing to see how various men will look at this question. Dr. Buckley with his chemical mind looks at it from a chemical standpoint and Dr. Hinkins looks at it from the standpoint of heredity and chemistry. Another man likes to believe that these things are brought about through certain chemical changes, and that is a beautiful chemical theory, Dr. Buckley.

DR. BUCKLEY: It is correct, isn't it?

DR. ROACH: It is correct as far as chemical theory is concerned. You know, we will never get far along in the eradication of decay until we go away back and find out how to overcome that by the vital resistance of the individual. There is where I think we have to go a long way farther than filling or repairing.

I was in hopes when Dr. Hinkins started out with his study along the lines of his paper, which was presented at a previous meeting, regarding food values, we would learn from him how to feed the mother so that the child would get into its makeup those vital elements of resistance to decay, so that the environment, whether the mouths be well kept or not, would still go with the conditions we see in connection with decay.

We are practicing dentistry to meet and take care of an artificial mode of living. That is my honest conviction in the matter. I do not believe there would be any particular need for dentists if people used their teeth according to the plan of the creator in the beginning. We are called upon to take care of the teeth and mouths of people simply because of the artificial mode of living. That is my idea as to the possibility of dentists meeting this condition of whether it is environment or structure. I am quite in accord with Dr. Johnson if he will extend the term environment to include that inherent vital resistance which the human being is born with and is given to carry through life.

DR. SIDNEY J. KNOWLES: This paper of Dr. Johnson's, particularly in this day of research work, deals with a subject that stimulates us to think and study more than ever before.

I was a little disappointed that Dr. Hinkins did not bring out the point that he presented in his paper some months ago and on which Dr. Roach has elaborated a little. Referring to the point that we as dentists are taking care of mouths of human beings who have become so civilized that they have developed mentally and suffered physically, I will say that their mouths, in a measure, have gone into a state of degeneration. My understanding is that the man who lived before us, who had well developed jaws and splendid teeth and normal healthy gum tissue, had these conditions because of environment and mode of living; that when he became more civilized and began to cook his food, he changed the material which was taken into his body, and this change brought about digestive disturbances. We also bring these changes about by the manner in which we live. It is not practicable for us to be cave men, but as a result of having been a cave man, let us say, I believe, as Dr. Roach has said, that through this normal way of living the man who lived before us had apparently better development of the teeth than we see to-day. Apparently, there are comparatively few teeth that are well fused to-day. It is possible to see in skulls well fused cusps and normal surfaces in these teeth. Whether that is entirely brought about through environment after the teeth have erupted, I personally doubt.

In regard to the teeth of people to-day not being as well developed as those of their ancestors, environment is probably as great a factor in the destruction of teeth as anything we have; still we have tissue in other parts of the body—tissue tone—which offers less resistance to

infection in one individual than the same type of tissue in another person during another time. In other words, man's physical condition may be so lowered through mental activity that he is subject to infection by the pneumococcus. The structure is exactly the same, but there is something that cannot be measured or seen which is so altered that the body does not offer resistance. Whether that is true of the teeth the same as it is of other parts of the body, is a question. It is true, the bony tissues in some individuals are very different from those in another, particularly in cases of rickets, and so on. I believe that the quality of the bone in one case is different from that in another.

I was of the impression from the paper that certain chemical changes that take place outside of the mouth in the soil can be put in a form so as to be easily assimilated while the teeth are being developed. I was guided in that thought by the deductions drawn by Dr. Gies at the New York meeting of the National Dental Association. He gave the results of some experimental work in which he injected dogs with methylene blue at the time the teeth were developing. When these teeth had erupted the structure of the enamel showed this deposit. In dogs where the teeth had developed the injection of the same material did not show within the enamel. Apparently, one time the methylene blue was taken up by the structure as developed, and in the other it was not. If the enamel has been calcified it has no effect.

As to perfect teeth, I had occasion to look into the mouth of an Indian, 56 years of age, whose environment was not desirable from a clinical aspect. I do not think I ever looked into a dirtier mouth in my life; yet he had never been sick in his life from the condition of his teeth. Those teeth were different in structure from the teeth of a poorly nourished boy brought up in a crowded community of a city. I think there is a difference in structure of the teeth of these two individuals. I also feel that the environment of the mouth in the Indian's case would have probably destroyed all the teeth in the mouth of the boy. Of course, that is theory.

I was very glad that Dr. Johnson in speaking of environment referred to prophylaxis, which is one of the most important subjects before the profession to-day. I do not believe in thirty-day prophylactic treatment. I believe in nature's prophylactic measures. The mouth and gums should receive treatment every 12 hours. If this is done it will offset the changes of environment that we are all confronted with. It is possible for us as dentists to instruct patients intelligently to carry on more perfectly the natural masticating forces. A dog, if he is properly brought up and given proper food, will chew bones, coarse material, and have a mouth that is filled with hard fibrous tissue. If that same dog is brought into the house his mouth will degenerate as a result of light friction. And the same

is true of the human mouth. I still think from a few isolated cases that there is a difference, but whether it is measurable or not, I do not know.

Speaking of prophylactic treatment again, if it is true that action has taken place in the mouth, due to the civilized way of living, and the teeth have become roughened, it is reasonable to assume that if these roughened surfaces of the teeth are intelligently polished again, which must be carefully done, they are less liable to decay. However, I don't believe in the radical position that is taken by some. It is quite possible to keep these surfaces polished and remove the source of trouble or change the environment.

Coming back to people who have chosen to be mentally developed and have suffered physically, how shall we meet that problem? I tell them to brush their teeth, and they go home and do so, which means no more than if a physician told us to be careful about our diet. But if a man will lay down certain definite principles to follow in his office, and instruct his patients to the effect that nature intended that people should exercise their mouths and gums and receive friction from the eating of unground foods, and tell them why and how to do these things, they will be in a better position to avoid the ravages of civilization.

DR TRUMAN W. BROPHY: I appreciate as thoroughly as any one can the value of this paper. When published it will have a very much larger audience and will set men to thinking on the subject of environment. I believe that correct environment is the most potent factor in preserving the human teeth, yet from my experience with treating teeth I recall certain circumstances which impressed me that environment was not the only influence responsible, but that structure has much to do with the preservation of the teeth. I recall an Italian with short, well developed teeth in a firm square jaw in close contact. The cusps of the molars and bicuspid were short. The bicuspid fissures on the occluding surfaces were very shallow, and the sulci in the molars were shallow also. The alveolar process was broad, and the gums dense and normal. There was no recession of these gums, the teeth were all perfect. I also recall a Swede whose teeth were long, whose alveolar processes were not so broad as those of the Italian. The gums were slightly receding. The fissures in the bicuspid were deep, and the sulci in the molars were also deep. The teeth were not so broad and strong as they were in the case of the Italian. They both came to this country at about the same time. Five years after they arrived here the Italian's teeth were good; they apparently had not changed. He gave little attention to prophylaxis. The Swede gave very little attention to prophylaxis. Five years after the Swede arrived his teeth broke down; the cavities in the molars were deep, and the bicuspid were broken away. The incisor teeth had become carious upon their proximal surfaces, and the

man was in a position to soon become edentulous. Was this a matter of environment, or was it a matter of structure? Possibly it was heredity. I think structure in those cases had more to do with the condition of the teeth five years after they arrived than environment because their environment was about the same. I believe very strongly in pedigrees. I believe in strength, health and vigor of the parents. I believe that strong and healthy parents will transmit to a child conditions that will make him more immune from disease than in the case of the child whose parents are not strong and vigorous. Compare, for instance, the offspring of strong, vigorous, healthy parents with the children of parents who are enfeebled by tuberculosis or who are possibly luetic. The child of strong and vigorous parents has every element in his structure which will take on the characteristics of his parents. And the same thing holds true very largely of the child born of weak or enfeebled parents, though after all, those same people with proper prophylaxis may go through life with comparatively good teeth. The weak child, or the man born of weak parents, will naturally be weak in every organ as compared with one born of strong parents. I have always thanked God that my parents were healthy, strong and vigorous, and I am sure I would not be here now if that were not the case, because I have been through enough to terminate the life of the average individual.

Regarding prophylaxis, there is altogether too much discussion of this subject in a way that is not correct. I am satisfied that dental prophylaxis as sometimes practiced causes an immense amount of harm. For example, in the last decade there have been innumerable instruments designed for the purpose of working upon the teeth—scalers, if you please. You may call them something else, but that is what they are. Many of these scalers are all right, when properly used, but I am satisfied that a very large percentage of dentists do not know how to use these scalers, and they use them with great detriment to the individual upon whom they are employed. I have forgotten the name of the man who gave a stereopticon exhibition here in Chicago in which he exhibited teeth upon which these scalers had been used by an enthusiast for the purpose of treating so called pyorrhea. He used them just as a carpenter would plane a board. He kept planing and planing, and planed these teeth down so far that the cementum was half cut away, and the patient was left in misery. He suffered intense pain for months by reason of the fact that the dentist had not judgment good enough to dictate to him that he should not take off any more than deposits. But the dentist felt it was his duty not only to take off deposits but to scrape the teeth, the cementum, and the organic matter of the cement was exposed to irritation, and the suffering he experienced was so intense that he laid awake at nights.

To have attempted to cauterize the surfaces would have been de-

structive to the gum tissues, and so this patient was allowed to go on suffering until nature after a year or two came to his relief and partially, but not wholly, relieved him by deposits or closing of the open spaces of the canaliculi of the cement. That is not prophylaxis. It is incorrect practice. If we could do something to prevent that excessive misdirected effort on the part of well meaning men who feel that they are doing the right thing to scrape teeth like that, we will have done a great work.

Lastly, prophylaxis, after all, is the most important of all considerations regarding the preservation of teeth, as I have tried to point out in comparing the condition of the teeth of the Italian and those of the Swede.

DR. L. L. DAVIS: Dr. Johnson has so carefully covered up his tracks that I can really sympathize with Dr. Buckley that he should have been called upon first to open the discussion on this subject, because Dr. Johnson has his paper so beautifully worded and so nicely arranged that it was impossible for the first man to pick any flaw in it, and if Dr. Buckley had been called upon last I think he would have changed his mind.

We went over this argument once before, and Dr. Johnson has had a good chance to incorporate every argument that was brought forth, and he has arranged everything in such a way that every part of it is right, and he is right. However, there are other ways of looking at this subject. There is not a thing that Dr. Johnson has said that can be gainsaid; at the same time, where are we going to stop with environment, and where are we going to begin with structure?

When Dr. Hinkins read his paper I brought up the question of heredity. Dr. Brophy has already referred to that. Heredity plays a greater part than anything else in the whole human economy. If you have got good parents, good ancestors, and forefathers, I don't care what the conditions are under which you were born. You may be born in a gutter and things will be all right. There must be something in structure. What is it? We don't know. Chemistry has not evolved it yet, but we do know this thing about chemistry, that there are certain carbon elements that have almost exactly the same chemical formula, but with the slightest change in the rearrangement, which modifies entirely the texture or the condition of the substance that is evolved, a change is brought about. Now then, if by any means we can place into the mother's system substances that will improve bone tissue that may be poor in structure, so that the mother's life blood will render these substances available for the embryo and bring about better conditions than there appear in the mother, the chances are that the child will have a better structure than the mother had. And so I say, if we at the present time can only evolve some method that will improve the structure in the parent,

we will have accomplished a great deal. This whole matter was started by the paper of Dr. Hinkins on food values. I am in hopes that at the May meeting of the Illinois State Dental Society at Bloomington we will have a paper by an authority along the line of food values. We are promised a paper of that kind. It is one of the things I am striving for, and if I get it, I think we will have something that will be worth taking a trip from Chicago to Bloomington to hear it. There is something in structure. Sometimes, when a person is in a condition of ill health, has colitis, or inflammation of the lower part of the intestinal tract, he will have a reflex action within the mouth. He will have a different condition of the secretions. That is environment as we speak of it and as Dr. Johnson speaks of it, and that kind of environment is going to produce its effects, I don't care what the structure of the teeth may be. If we go back to first principles and take a person who is born from poor parents, with a tendency to this or that or the other thing in the shape of physical weakness, and then if that person should have this disturbed condition, whatever it may be, his teeth will break down and become decayed more rapidly than they would in the mouth of a person who comes from good parents, with good bodily condition naturally. It is exactly the same condition that occurs as far as physical elements go with the same environment, and also as far as the teeth are concerned, and yet in the two individuals we will have a different condition. One will resist decay of the teeth and the other will not. Whether it is due to a difference in hardness or softness of the tooth structure I do not know. But there is some molecular or chemical arrangement of the tooth tissues by which one will resist the action of decay far greater than the other. That is the sum and substance of the whole argument.

As far as prophylaxis is concerned, we all know that where such conditions as I have mentioned in regard to bodily health are concerned, if that person will take fairly good prophylactic care of his mouth he can fight the ravages of decay to a certain extent. So that is another argument in favor of environment. Everything Dr. Johnson has said is right, but the question is, how far are we going back of environment, and where are we going to draw the line on structure?

DR. J. G. REID: I was in hopes that this thing would be settled before I was called upon to discuss the paper. I have heard excellent arguments tonight on this subject pro and con, but am left in the same position that I was before there was any argument advanced on the subject.

I have passed through a period in the practice of dentistry where I thought I might see some things I could rely upon; then I came across other things that knocked my theories to one side, and now I have come to the question of structure and environment. There is

not a man present who could not cite instances in his own practice covering a period of a number of years which would enable him to present the most favorable argument upon either side of this question, and as I sum it up, it is about six to one and half a dozen to the other. I think a great deal depends upon structure, and a whole lot depends upon environment. I could illustrate this by a case that I have had under observation for the last two or three years of a young lady who has been my patient from childhood. I took care of her first molars. She came to me when she was six years of age. She is forty or more years of age, and that woman had as beautiful a set of teeth up to five years ago as any one would want to look at, and in the past three years I have had my troubles in caring for her. Her teeth have gone to pieces. Her care of these teeth has been just as diligent up to the present time as it ever was in her life, and if anybody ever took care of their teeth she did, and she had a beautiful set of teeth by so doing. She has appeared in public occasionally, and for the past five years she has bumped up against many things that would kill other people. She has lost her parents, brothers, sisters, has sustained financial losses—in fact, almost everything that you can think of within the past five years, and during this period her teeth have gone to pieces. Now, I suppose that was environment and it undoubtedly was. There is no question about it. There has been a physical destruction, a lowering of vitality evidently of some kind. I do not know what it is. She seems active. She seems to bear these burdens with the greatest fortitude. You would not notice it in her, and yet when she tells you of her troubles you must know that she has undergone a severe and intense mental strain, as well as physical strain.

I do not suppose there is a member present who does not know of the case of Dr. Crouse. There was an instance where the same conditions prevailed. Dr. Crouse had splendid teeth, and yet through the great loss he had sustained in the latter years of his life his teeth went to pieces. What is it? The structure of these teeth was perfect. The inheritance was good in both instances. I can recall not only this particular case, but I could cite a number of similar instances, but this is the most marked one that has ever come under my observation. It only goes to show that a beautiful structure can be brought to destruction by certain conditions, and those conditions are manifested through all our lives individually. There is something that is constantly interfering with the laws of nature somewhere and at some time. We go to pieces in two or three years, and then revive again. We are able to overcome certain conditions. We are restored or regenerated. Normal conditions are brought about. I believe as Dr. Roach and Dr. Brophy have stated, in a large family there will be some member of it who has got to suffer, but even in a large family its members do not all have the same conditions. It is difficult to draw

the line between environment and structure. This paper is going to set a great many people thinking. The author has given us some thoughts and ideas that will stimulate us to pursue this subject with considerable interest in the future. It is an old subject newly revived. It is timely.

DR. J. H. WOOLLEY: The question that has been raised by the essayist, namely, is it environment or tooth structure? is a very important one, and Dr. Davis has really made my speech when he said that he believes inheritance or heredity is one of the greatest factors in settling the question.

A number of years ago, when I was interested in this subject of tooth structure and environment, after having read a good deal about it, I experimented a little on one of my patients. As she was pregnant I induced her to take up the study of hygiene and to prepare herself for the development of the child in utero, using food of the proper kind that would develop bone substance and proper structure for the teeth of the child, so that when the child needed the services of a dentist for the second teeth there would be less trouble with them than in the average cases, and yet in this particular instance I never saw worse teeth than this child had.

DR. JOHNSON (closing): There are a great many things to be said yet, notwithstanding the discussion we have had. In the first place, I am utterly amazed that there are so many who cannot draw the line between structure and environment, particularly men of the caliber who sit around this table. There is as much difference between what is meant by structure and what is meant by environment as there is between the color of black and white.

DR. KESTER: Has not environment a great deal to do with structure?

DR. JOHNSON: Certainly it has. I have been making that argument. By structure we mean the physical makeup of the teeth—the teeth themselves; by environment we mean influences which surround the teeth.

With reference to the remarks made by Dr. Hinkins, I was not saying anything in regard to quantitative and qualitative analysis of the teeth. That has nothing to do with the question raised in the paper; nor did I refer in particular to artificial modes of living.

I want to call your attention to the fact that dental decay is not a modern disease. We have evidences of the awful ravages of dental decay among the skulls of Egyptian mummies, and so dental decay is not a modern disease by any means. It may be more prevalent to-day than ever, but the savages themselves had a great deal of decay of the teeth. I have the model of the mouth of an aboriginal of Australia, and he is supposed to be the lowest type of all human beings. His mouth was very large, with teeth that you would describe as being of such perfect structure. These teeth were broad.

The incisors were almost as broad as ordinary molars; the jaw is very much larger than the average human jaw in a white person, and yet that model shows the ravages of decay rampant over that mouth from that old aboriginal, and I feel sure it was due to environment. There was a case where, if structure was ever well laid down in a mouth, it was in that mouth.

I shall not attempt to cover all of the points that I have outlined, but I am going to refer briefly to some of the remarks that have been made in connection with the cases of caries. That is the most significant thing that has been said in the discussion. In following the clinical histories of patients we often see these manifestations arising in a patient who is susceptible to decay for a time during youth. Youth is quite a susceptible period for dental decay. We also have senile decay, but decay of the teeth in youth is the most prevalent of any. You have all observed this fact: if you take a boy or a girl in whose mouth decay is going on extensively, you can take that mouth and by giving it proper dental attention, although our reparative processes are merely makeshifts, with the co-operation of the patient, you will find this, if you watch that case that has been susceptible, the decay will pass away in a few years and you will have a definite period of practical immunity that you did not have before in that mouth. You may refill teeth that you had previously filled; you may find recurrence of the decay, but the tendency for beginning of decay has passed away from that mouth practically. Something may change the mode of living in that individual and you may find a recurrence of susceptibility.

Dr. Brophy cited two cases, one in a Swede and the other in an Italian. As I understand from his description, the mouths were practically immune from caries when these individuals came to this country. After five years in one case the teeth began to decay rapidly, and in the other they did not. I want to raise the question, was that change in susceptibility due to a change in the tooth structure, or was it due to a change in environment from different mode of living? I should answer that it was due to a change of environment, from the mode of living, which changed the secretions in the mouth, and the tooth tissue did not change a particle until broken down by decay.

DR. REID: They lived the same kind of life here.

DR. JOHNSON: They did not live the same kind of life here that they did in Sweden and in Italy.

DR. BROPHY: Coming to this country as they did they left the environment they had at home and took on the environment of this country, and in one case we have decay of the teeth and in the other not. Why?

DR. JOHNSON: There may have been a greater change in environment in one instance than in the other.

DR. BUCKLEY: The Swede took on American environment more so than the Italian did.

DR. JOHNSON: Let me carry this a little farther. The case mentioned by Dr. Reid we all know about. Dr. Buckley cared for that case. Let us take another instance. You may take a board-of-trade man, carry his teeth along and keep them under good control for a considerable time, but let a panic come that lasts for months and the nervous tension of that individual is such that within six months or less the teeth will begin to go to pieces. Is that due to a change in the structure of the teeth? Has something been taken from the teeth by the circulation that has made them less resistant than before to decay, or is it because a change has taken place in the condition of the environment? It is a change in the environment, but not of the tooth structure. The tooth structure is not built up and torn down in the physiological processes of nature as are other tissues of the body. Take another instance of a pregnant woman. That point has been mentioned to-night. When I was a student we were taught to believe that it was almost inevitable that when a woman became pregnant and began to raise children her teeth would inevitably go to pieces. I was taught that as a student and I respected my teachers. I was taught that it was due to the fact that the lime salts were taken from the mother to build up the teeth and bony system of the baby. That is the most fallacious doctrine ever taught. It has been disproved time and again. We do not see the same percentages of mothers losing their teeth during pregnancy to-day that we did 25 years ago. If you will observe that, you will find there is not the same tendency to-day that there was then. We, as dentists, do not dread the period of pregnancy as we did in those days. Is that because the teeth of the mother to-day are changed and built up more strongly for that process than they were 25 years ago? Not by any means. It is due to the fact that we take better care of their mouths. Medical men and nurses have learned that. The trained nurse now carries out oral hygiene among pregnant women, preventing them from having ravages of dental decay. It is the condition in the mouth surrounding the teeth that has been looked after by the physician and nurse.

DR. REID: There is a physical change in the system of the woman.

DR. JOHNSON: That may be true, but I am talking about the distinction between the tooth tissue and the conditions which surround it. We can surely draw the line between the tooth structure and the conditions which surround the teeth. I am asking whether it was the tooth structure that underwent a change or was it the conditions which surround the teeth? In other words, is it structure or environment? That is an important question in the relations in which I have stated it. If it is a matter of structure you and I are helpless because when

the teeth are once laid down in the jaw you cannot change the constituents of those teeth. You may dope a patient all you wish with lime salts, but you cannot change the inherent structure of the teeth.

DR. KESTER: I did not suppose there was any argument on that point at all. I don't know that any one claims that the tooth itself has changed structure, but the tooth as it was built up originally was deficient in structure.

DR. JOHNSON: If it is a matter of tooth structure, how do you account for the manifestations we have been talking about? These teeth must change in structure, or it is a matter of environment.

DR. KESTER: It is a matter of environment.

DR. JOHNSON: You acknowledge then it is a matter of environment. I have studied the mouths of patients carefully and by paying attention to the conditions which surround the teeth and keeping them in as nearly normal condition as possible we can accomplish a great deal. Filling the cavities of these teeth is only an incident in the management of these cases. By attending to the reparative work and instituting prophylactic measures in conjunction with the patient I have been able to bring about a condition of immunity years earlier than I otherwise could have done. If we admit that it is a matter of structure of the teeth, we are perfectly helpless in fighting this disease. This is an important matter for us to study. I want you to have clearly in your minds the distinction between the structure we are talking about and environment because there is a line of demarcation between the two. It gives a different point of view in one instance from the other. Most of you will remember the time when patients got the impression that their teeth were so soft that they could not be filled with gold. I have had patients say to me, "My teeth are too soft to be filled with gold," and many a patient has given decayed teeth up and condemned them on account of this false theory taught, in the first place, by the dentist. A dentist is not doing his duty when he promulgates that kind of doctrine. Such a doctrine is accountable for the loss of more teeth, perhaps, than any other theory.

There is a great possibility in taking hold of these cases as they come to us and studying the conditions surrounding the teeth, rather than the structure itself. As I have said, filling the cavities of the teeth is a mere incident, but of course it is a very important incident.

ANNEAL A LINGUAL BAR.—In the construction of lingual bar cases for partial dentures where the bar is to be soldered to gold saddles, the bar should be thoroughly annealed after bending and final adjustment has been completed, otherwise the heating in soldering will cause the bar to spring, and the case will not go back to place properly on the cast, and failure will result in the mouth. This result will also obtain in vulcanite cases unless bar is annealed before final adjustment.—*Victor H. Fuqua, Chicago, Ill., Dental Review.*

Dr. Taggart Loses Suit in United States District Court

JUDGE F. A. GEIGER, District Judge of the United States District Court, Western Division of the Northern District of Illinois, has rendered a decision against Dr. William H. Taggart, in his suits against Dr. M. D. K. Bremner and twelve other dentists, declaring that three of his four inlay patents are invalid, and that one is valid. The patent entitled, "Apparatus for Making Castings," which refers to Dr. Taggart's casting machine, is conceded as valid. The patents entitled: "A Method for Making Molds, Inlays and the like;" "Apparatus for Making Molds for the Casting of Dental Fillings and the Like," and "A Method for Making Dental Inlay Fillings and the like," are declared invalid on the ground that they do not contain new and novel ideas. The decision is published in full in the April 15th issue of *The American Dentist*.

FACTS SHOWING PRIOR USE AND PRACTICE OF INLAY METHODS.

Dr. B. F. Philbrook, of Sioux City, Iowa, put cast fillings in patients' teeth in 1895. He read a paper before the Iowa State Dental Society in 1897, describing the work.

Dr. John A. Lentz, of Phoenix, Arizona, secured patent rights on inlays in 906. Application filed August 30, 1905, Serial No. 276,428 and No. 833,883.

Dr. M. W. Hollingsworth, of Nordhoff, California, taught the lost wax method of dental casting in 1902. He secured a patent under No. 708,811. He wrote on this method in Essig's Text Book of Prosthetic Dentistry, 2nd Edition, page 730.

Dr. J. S. Schottler, of Milwaukee, Wisconsin, made cast inlays in 1904.

Dr. George B. Martin, of Frankfort, Indiana, taught the process of making cast inlays at Indianapolis before 1900.

Dr. J. E. Fleener, of Oskaloosa, Iowa, used a cast inlay method approximating that of Taggart in 1903.

Dr. Frank Winchester, of Jackson, Michigan, set cast gold inlays for his patients more than fifteen years ago.

THE MOST IMPORTANT PIECE OF EVIDENCE IN THE TAGGART INLAY PROCESS PATENT SUIT.

The most important piece of evidence in the Taggart case, according to the *American Dentist*, was found in a paper by Dr. B. F. Philbrook (formerly of Denison, Iowa, but now of Sioux City, Iowa), entitled "Cast Filling," which was read before the Thirty-Fourth Annual Meeting of the Iowa State Dental Society, at Des Moines, May, 1897, and published in the journal of the transactions of the society for that year. Dr. Philbrook's paper and the discussion pertaining to it, follows:

"CAST FILLINGS."

Paper read in 1897 by Dr. B. F. Philbrook. The parts in italics were not italicized in the original article, but we have thus emphasized them because in the trial of the Taggart case they were regarded as having especially important bearing.

"I desire to place myself on record as in favor of both crowns and bridges, whenever the condition of the mouth and remaining teeth justify their use. I also desire to condemn the sacrifice of teeth or parts of teeth, for the purpose of crowning or bridging, where a more conservative plan is available. The crowning of teeth is and should be the last resort to continue their usefulness. One of the more conservative plans is what is offered in cast fillings.

"Amalgams have not, altogether, proved a trusty sheet anchor, especially where a large portion of the crown is involved. How frequently those of us who have been in practice some years, have noticed the decided failures of this class of alloy fillings! It is no uncommon sight to see an elegant, nicely polished, alloy filling, restoring a large portion of a molar or bicuspid in the condition termed 'leaky,' even after the most careful excavating, packing and polishing by some painstaking operator. It may be only a few months or even weeks before this condition begins to manifest itself. No matter how carefully packed or nicely polished, we find its edges apparently drawn away from the walls of the cavity to such an extent that we can introduce the point of an excavator between tooth substance and filling; hence it is termed leaky.

"This noticeable changing of alloy fillings has formed the subject for many of our writers and theorists, and many and varied have been the reasons assigned,—all the way from negligence of the operator to the influence of the mercury in its endeavor to return to its spheroidal form.

"The study of these conditions has led me to experiment in the casting of fillings; and my success has suggested the subject of this paper. The metal I have used so far has been what is known as Watt's metal, designed for casting dentures. It is not easy to tarnish and holds its color well in the mouth. It is also quite malleable, a property which in this work is of no small advantage. Neither does it shrink or expand, consequently if you secure a perfect impression of the cavity, the filling when cast will be an exact fit. We then have a simple, perfect fitting inlay to be cemented to place by either oxy-phosphate or gutta percha.

"This operation, in my estimation, is superior to a large alloy filling: First, as there is no danger of its becoming dislodged or mutilated while in a plastic state. Second, if cemented with gutta percha, that forms a protecting cushion over the ends of the enamel rods, and in case of a living pulp guards against thermal changes. Third, you can get a better occlusion, consequently making the tooth more useful in mastication.

"This work may be extended to include nearly all of the different forms of bridge work, removable or others, *and for single crowns where bands are not used*, on molars especially, it is equal to the best. In fact, the limit of use for this metal in the mouth is bounded only by the inventive genius of the operator."

DISCUSSION.

DR. J. B. MONTFORT: This is rather a new subject and something that is entirely new to me. Of course, it is in the same line as inlay, and the same results could be obtained as in inlay work of other sorts. I can see how it can be made practicable in a great many cases, although it is something entirely new to me. I am glad the doctor has given us his paper. He has given us something to think about.

DR. A. R. BEGUN: As the doctor has given us his method, I would like to have him explain his method of taking an impression.

DR. PHILBROOK: The best method of taking an impression of the cavity will lie with the operator. I will speak of one class of cases, those of the proximal surface. I take what is known as wire gauze, such as strainers are made of. I put the matrix between the teeth at this point. *I then cut the cavity in such a shape that the impression will come away without breaking.* I do not care to make an exact impression, if I get a perfect impression of the margin. *Often times I file away the back of the inlay, but the margin is what I want.* You may fill the back with gutta percha or cement. I use wire gauze so that the plaster will enter the meshes. I use plaster in almost all of my impressions. I have used modeling compound, but the cavity must be so situated that the impression will come away without breaking. I do not offer this idea as a panacea for all evils. It is just one. *I will say further that if anyone wishes to cast a gold inlay he can do so.*

DR. J. E. FLEENER: I wish the doctor had told us how he retains those fillings there; by what means he retains them in their proper position after he has once obtained it.

DR. PHILBROOK: I will answer this gentleman in the manner in which I wrote the paper. *I did not go into details.* I retain it by undercuts usually. These fillings I have made are usually large, and cases where a great many would have used crowns. Some of the inlays I have put in have been at least two-thirds of the crown. I secure it by pins. I place these pins in the roots and have the same anchored. I warm the inlay and place on it the gutta percha, and then trim off the surplus gutta percha which there may be at that point. I use eucalyptus. I wet the cavity and warm the inlay and press it to place. The eucalyptus will attach to the gutta percha and make it stick. The most of my work has been done with gutta percha.

The securing of a copy of the published proceedings of the Iowa

State Dental Society for 1897, containing this article by Dr. Philbrook, was a great thing for the attorneys of The Dentists' Mutual Protective Alliance. They knew by conversation with Dr. Philbrook that such a paper had been read, but they needed the printed record to verify and support his evidence. When they began a search for copies of the printed proceedings of the Iowa State Dental Society for 1897 it was soon found that most of the edition had been lost or destroyed and so far as the attorneys have been able to discover only three copies of this important document are now in existence.

PERTINENT PARAGRAPHS FROM JUDGE GREIGER'S DECISION.

Speaking of some of the extreme claims urged by the plaintiff Judge Geiger remarked:

"The claim of novelty in 'pointing' the sprue-former is about as well founded as would be a claim of novelty in the suggestion that a sharp knife is more serviceable than a dull one, or that a lead pencil writes better when sharpened than when it is not; and the same criticism is suggested by the claim of novelty in reducing the shank of the sprue-former."

Disposing of the plea of Dr. Taggart's attorneys, urging the novelty of the Taggart method because that method embodied features not followed by Dr. Philbrook, the decision reads:

"It may be, and doubtless is true that Philbrook did not in his practice follow every step referred to in the many claims of the plaintiff's patents, thus, for example, the matter of supporting a pattern by means of a sprue-former, as disclosed by the plaintiff, may have found no place in Philbrook's work. But here, again, it is difficult to conceive of any apprehension of molding art through the lost wax or other practice without including a sprue-former, or some sort of pattern holder. At all events, prior to plaintiff's application, Hollingsworth, either as a mechanic or genius, had supplied the suggestion, and it is impossible to credit Taggart with a discovery beyond what is shown in the Hollingsworth patent."

Much importance was attached to the testimony of Dr. J. G. Schottler, of Milwaukee, Wisconsin. That it affected the judgment considerably is shown by the following excerpt from Judge Geiger's decision:

"A careful reading of his (Schottler's) testimony and its consideration in the light of what had been published upon the matter of casting with the use of disappearing models, forbids the conclusion that his story is fabricated or that a conscious or unconscious zeal, stimulated by his knowledge of later-day practice, led him to a complete distortion of the facts as they actually transpired. His recital of details gives the impression of inherent truth largely because of the lack of pretense of great refinement of method or the use of highly organized appliances in its practice. His reference to development and

improvement of manner of making a model and investing it,—starting with his efforts in the use of cuttle-fish, which, being impracticable, led him to investment of a wax pattern in ordinary material, his crude and later improved method of applying pressure, having the ring of truthful narrative.”

PRESENT STATUS OF CASE.

Attorney Williams, counsel for the Dentists' Mutual Protective Alliance, in giving a review of the work done in fighting the Taggart patent, stated that it had been found necessary to go to South Dakota, Colorado, Arizona, Texas, Tennessee, New York, Connecticut, and every other State within these boundaries, in order to locate and interview all of the witnesses who might contribute anything toward the establishment of the defenses of prior use, upon which it was found mainly necessary to rely. It was necessary to interview not only the dentists who claimed to have employed this method, but also their assistants and their patients.

At the time of the trial there were literally scores of dentists and their patients whom it was necessary to bring to Chicago to testify. Many of the patients still had in their mouths inlay fillings which were made prior to 1907 by methods involving one or more of the features claimed in the Taggart patents.

These Taggart cases involved the longest open court trial and the examination of a greater number of witnesses than any other patent case which has ever been tried.

The actual trial was limited to the cases against thirteen defendants who employed typically different methods and apparatus in the production of cast inlays. These thirteen cases were selected in order to afford the opportunity to try out and secure an adjudication upon every possible question which could arise under the Taggart patents. So far as one can see, there is no point which could arise under any of these patents which is not covered by Judge Geiger's decree in the cases just decided by him.

Dr. Taggart's attorneys claim that they expect shortly to take an appeal to the Court of Appeals, which is the court of last resort in patent cases. Attorney Williams states that if the profession is willing to meet the expense of this appeal they can have judicially settled, once and for all, whether a dentist is free to make and set a cast inlay without paying to Dr. Taggart any royalty or license fee which he may see fit to demand.

METHOD OF POLISHING VULCANITE OR METAL PLATES.—After filing and scraping, use a leather washer (same as are used for the ordinary water tap) on the lathe in conjunction with equal parts pumice and emery powder (knife polish). This quickly takes out all scratches without the use of sand-paper. Proceed then with brushes in usual manner.

Chronic Diseases of the Mouth of Interest to the Physician

K. H. THOMA, M.D., BOSTON, MASS.

Lecturer in Oral Histology and Pathology, H. U. D. School; Oral Surgeon to the Robert B. Brigham Hospital.

THE mouth is frequently the seat of chronic diseases which may exist for a long period without giving local symptoms. The patient, having no discomfort in the diseased part, is usually unaware of the condition. As no special complaint is made, such chronic diseases sometimes develop under the very eyes of the general practitioner of dentistry. But these conditions which are just the ones which so frequently are the cause of obscure symptoms in neighboring parts or foci of systemic diseases. A review of the pathology and diagnosis of chronic diseases of the oral cavity should, therefore, be of interest to both the stomatologist and the physician.

1. *Chronic Infection of the Jaws.*

Chronic infection of the jaws may be the termination of an acute type, but more often they occur independently, developing and growing without giving symptoms or discomfort. Two classes may be distinguished, the circumscribed and diffuse forms. The circumscribed forms are common and receive special names in dental nomenclature, according to their development or cause.

A. *Chronic Alveolar Abscess.* This is the condition which follows the acute abscess or old-fashioned gum-boil. It is due to neglect or unsuccessful treatment and we frequently find sinuses on the face or in the mouth which are, as a rule, the only indications of the lesion. The discharge of pus may be more or less marked, sometimes stopping and then becoming greatly aggravated. The sinus cannot be closed successfully unless the cause of the chronic abscess is removed and this is usually a tooth with a diseased pulp or a necrotic root end.

B. *The Dental Granulation or Blind Abscess,* one of the most common forms, is a reaction to a mild injury, causing an inflammatory proliferation of the peridental membrane. It is characteristic of the lesion to start and continue to grow for a long time without the patient's knowledge and without symptoms of inflammation. The granuloma, which grows in the cancellous part of the bone causes a carious condition. It is attached to the end of the tooth root and surrounded by a fibrous capsule, through which a great many blood vessels pass. The inner part is made up of inflammatory granulation tissue (fibro-blasts and vascular endothelium), infiltrated by a large

mass of plasma cells and a smaller number of leucocytes, lymphocytes, eosinophis and mast cells. Epithelium may be found proliferating through the granuloma, due to the inflammatory stimulation of epithelial remnants from the enamel organ. One or more places may be found where necrosis occurs. Polymorphonuclear lymphocytes then accumulate in large numbers and, if the destructive process becomes extensive, an outlet to the surface or sinus is formed and the condition is evidenced in a sub-acute attack. Other retrograde processes are often observed in the blind abscess or dental granuloma, such as fatty degeneration, hyalin formation and, in old granulomata, cholesterin formations, which can be recognized by the rhomboid spaces left by the crystals, which dissolve during the hydration in alcohol. These lesions seldom spread to neighboring teeth, but occasionally grow into periodontal cysts of large dimensions. Toxins and bacteria are absorbed and clinical evidence is at hand to prove that various somatic diseases are due to blood-carried infection or intoxication. The root end most always becomes necrosed and is often partly absorbed. This increases the chronicity of the disease and is the reason why medicinal treatment of such teeth is most always a failure.

Diffuse Osteomyelitis of the Jaws. Fortunately the infections of the jaws almost always remain localized; and if we consider the frequent occurrence of dental infections involving the jaws it is surprising how rarely one encounters a case of diffuse osteomyelitis. Such a condition, affecting the mandible, is well exemplified in the following case: The patient, Mrs. L., a woman 26 years old, married and doing housework, had been in perfect health. December 24, 1915, the patient had a tooth capped by her dentist. December 26 the tooth was extracted by another dentist on account of an abscess. December 28 patient went to hospital and received palliative treatment. January 18, 1916, she complained of pain in the lower jaw, inability to open her mouth and soreness of the teeth. Temperature 99.5 degrees F. Examination revealed that the only teeth of the mandible present were the front ones from the left lower first molar to the right lower second bicuspid. All these teeth were extremely loose and there was evidence of the right lower first molar having recently been extracted. All the remaining upper teeth were firm and in good condition. Roentgenograms showed a large area between the sockets of the extracted right lower molar, whence it extended around the chin to the other side of the jaw. Two Wasserman tests were negative. I operated January 20, extracted all the loose teeth and curetted the entire cancellous part between the cortical plates, removing many small sequestra. The wound healed up rapidly. Two more small pieces of bone were expelled later. March 2 the patient returned with swelling and pain on the left side. Another Wasserman test made at this time was negative. A new set of Roentgenograms showed that healing was

taking place on the right side, but that the process of disease had involved the left side extensively. I operated on this side March 3, and from then on the healing continued normally. September 18 two more small sequestra became evident, one of which I removed from the mouth and one from the submental region. The wound healed by first intention. November 25 an abscess seemed to point at the left angle of the lower jaw, where there was also considerable callous formation. By incision and exploration I removed a small sequestrum, but the sinus continued to discharge.

Another set of Roentgen pictures showed a normal condition everywhere except at the left angle of the jaw, where another small sequestrum was found in the middle of the bone. This I removed, excising the sinus and closing the wound, which healed by first intention. The hard swelling on this side of the jaw disappeared gradually, so that the outline of her face is again normal.

Chronic Maxillary Sinusitis. Maxillary sinusitis, especially in its chronic form, occurs much more frequently than is supposed. Patients seek relief from the discharge of pus and other symptoms of acute inflammation, but the chronic disease which manifests itself more indirectly by poor general health, loss of weight, toxemia, mental depression, arthritis, or other focal infections, is quite often overlooked. Maxillary sinusitis may be caused by either diseases of the nose or of the teeth. According to Brophy, about 75 per cent. of the cases are due to dental infection, and usually they follow the occurrence of alveolar abscesses on the teeth which are in relation with the sinuses. The teeth, therefore, should always be investigated, and it should be kept in mind that diseases of the nose may be only an exciting cause, activating an old and chronic condition.

The upper molars and bicuspid should be Roentgenographed in cases of maxillary sinusitis, and the dentist, in turn, should advise his patient to have the sinuses investigated should he find suspicious conditions in films of the upper teeth.

CASE REPORTS.

1. Patient.—Mr. W. W. C.

History.—Pain in zygomatic and infraorbital region and discharge from right nostril. A frontal Roentgen plate showed radiopacity of the right antrum. The cause was ascertained by a film which showed radiolucent areas on two roots of the upper first molar, indicating abscesses.

Operative Findings.—The antrum was filled with polypoid growth, the bone over the molar being entirely necrosed.

2. Patient.—Miss G. W.

History.—Complains of bad taste in nasopharynx, but no pain whatever.

Roentgen Examination.—Intraoral films show many teeth with evidences of root canal work and radiolucent areas, indicating abscess conditions, which extend to the maxillary sinus. A frontal plate shows radiopacity of the right antrum.

Operative Findings.—Large necrosed areas were found in the upper jaw and the mucous membrane of the antrum was covered with granulations.

3. Patient.—Mrs. H. K.

Roentgen Examination.—Routine Roentgen examination shows many diseased roots in the upper jaw and radiopacity of the maxillary sinus.

Operative Findings.—The bone forming the floor of the antrum was necrotic, the antrum being completely filled with polypoid growths.

4. Patient.—Miss A. P.

History.—Patient was in poor health and was referred by her dentist for extraction of the left upper molar. After extraction of the tooth a probe could be passed into the antrum.

Roentgen Examination.—The previously taken films of the teeth showed a large radiolucent area on the roots of the upper first molar. All three molars were devitalized. A frontal plate taken immediately after the extraction showed radiopacity of the left maxillary sinus and a cyst of the right maxillary sinus.

Operative Findings.—The left antrum was filled with polypus granulation tissue.

5. Patient.—Miss M. L.

History.—Patient was in a run-down condition for a considerable length of time. Had been under her physician's care for some time, but did not improve.

Roentgen Examination.—Showed indications of many pus pockets and abscesses in the right upper jaw. Frontal plate showed involvement of antrum.

Result of Operatoin.—After removing teeth and treating antrum the patient improved rapidly.

6. Patient.—Mr. D. G., aged 34 years.

History.—Five weeks before he came to me he started to have rheumatic swellings and pains in the knees. The shoulders were next attacked, and after a short time all the large joints became involved. He was ordered to take electric baths, which he did, but with no apparent effect. When he was referred to me he was walking on crutches and was in great pain. There was no pain at all in the mouth or face.

Roentgen Examination.—Showed radiolucent areas indicating abscesses on an upper incisor and upper molar. The antrum was suspected, and when a picture taken showed it to be radiopaque.

Operative Findings.—The antrum when opened was found to con-

tain inflammatory granulation tissue, caused by the tooth which was extracted.

Result of Operation.—Patient first suffered exacerbation, due to the surgical auto-inneculation and had to stay in bed for a few days, not being able to use his joints. He then began to improve, and after seven weeks was entirely rid of all arthritic symptoms.

3. Cysts. We distinguish two types of cysts of the maxillary bones—dentigerous and periodontal cysts.

A. *Dentigerous or Follicular Cysts* are of comparatively rare occurrence and are caused by the tooth follicle of an unerupted, impacted, super-numerary or misplaced tooth or tooth germ. They may contain one or many well-formed teeth or rudimentary tooth masses, or they may be formed from the enamel organ without a tooth being developed. They contain no pus unless infected through an opening into the oral cavity.

Periodontal or Radicular Cysts. These are cysts of inflammatory, infectious origin and are usually formed by an epitheliated dental granuloma. Epithelial remnants of the enamel organ, which are normally found in the periodontal membrane, have a tendency to proliferate when stimulated by chronic inflammation and are apt to grow over the inside surface of the granuloma. Exudates accumulate in the lumen, and as they increase the cyst grows at the expense of the bone. A Roentgen picture will indicate a cyst clearly, showing a large radiolucent area, usually connected with a tooth, which is devitalized or has a diseased pulp, sticking into it. Multilocular cysts start in a similar manner. They may originate either from the formation of cysts on more than one tooth, or from the development of cysts in various medullary spaces of the cancellated part of the bone, the fluid accumulating and extending them, leaving bone lamellae between. Periodontal cysts are sometimes found unconnected with a tooth root, but in such cases the guilty tooth may have been previously extracted, the cyst having escaped notice, or there may have been only a granuloma at the time of extraction, which later grew into a cyst. I have observed many interesting cases of such cysts, of which I shall cite two typical ones.

The first, a man about 30 years old (Mr. G.), complained of a tender place on the outside of the face, which he noticed when shaving. The operation disclosed a cyst filled with pus containing cholesterolin and lined with a membrane which was covered by epithelium. It was found between the two bone plates, but the outer plate had a hole in it, as shown in the Roentgen picture, and this was the place where the patient felt the tenderness.

In another case, that of a Mr. F., the patient was unusually well until about a year before he came to me, when he broke down after a severe attack of grippe, the symptoms being those of nervous collapse.

He was in the South for two months and then returned to work. Was examined at Johns Hopkins University and was obliged to give up work again and take a month's vacation in the mountains. While there he had some palpitation and dyspnea and evidently was very anemic. For some years he suffered from hemorrhoids and on Aug. 17, 1916, was operated on by Dr. Chittenden Hill. At this time the blood examination was as follows:

Hemoglobin	70%
Leucocytes	10,000
Red Count	3,000,000

Smear showed slight degree of achromia. On Aug. 28 the blood count was:

Hemoglobin	85%
Leucocytes	6,000
Red Count	5,300,000

On Sept 18 the blood count was as follows:

Hemoglobin	85%
Leucocytes	7,000
Red Count	5,120,000

The patient at this time had recovered from the operation entirely and seemed in much better general health. The white count, however, seems to have increased again and the red count to have decreased. A Roentgen examination on Sept. 18 showed a large periodontal cyst of the jaw and abscesses about the roots of two more teeth. About 16 years ago the patient had an acute abscess on the left lower first molar, which had to be extracted. The abscess was apparently left in the jaw and grew into the present cyst. After opening into the cyst pus, which apparently was under pressure, escaped at once. The bone cavity was lined by the usual cyst sac and contained the tip of the root of the first molar. I operated on Oct. 4, and on Oct. 11 Dr. E. A. Locke's report shows the following blood count:

Hemoglobin	95%
Red Count	5,500,000

The patient was seen again eight months later, when he reported that he had been perfectly well ever since.

The relation of these lesions to the general health of the patient is not in the scope of this paper. A large number of careful clinical observations have proved, however, that many somatic diseases are due to focal infection. The mouth is one of the important parts of the body where such foci occur, and it is essential to understand the chronic oral lesions. Their recognition, treatment and prevention becomes more possible by appreciating their etiology, their histo-pathologic picture and their Roentgenographic appearance.—American Journal of Surgery.

ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, JULY, 1918

No. 7

EDITORIAL

Get Away!

In the Name of Better Health and Better Dentistry—Study This Suggestion.

“GET AWAY from the office,” is the advice of the Mortimer Company, who, in the following words, urge all their clients to break away from the regular routine and take a holiday.

Get away out where woody banks of a stream curve cool and sweet—where birds forgive you having missed their melody so long.

Get away to where black bass hug the rock shadows, or to foam-flecked brooks where wary trout flirt with your floating flies, or to cool lakes where pickerel play havoc with tangled lines among lily-pads.

Get away to where the drone of bees and balmy breeze lures you to loaf in lush grasses and to day-dream or drowse awhile—where the nursing lap of Mother Earth soothes the ache of busy brain. Wade in the water, else you miss a joy. Get wet, get hungry, get tired—and grow happier.

And, before you turn your feet toward home, cover the fish in

your creel with green tree leaves and pick a couple of handfulls of the wistful wildflowers that hide behind logs, gracing them with the tender fronds of lace-like ferns, and take them home to HER. They will make her happier than a gem from Araby. You'll be a bit weary, even muscle-bound—but, oh! man, watch the next week's work For the sake of efficiency—*get away*.

R.C.D.S. Extension Courses, Western Canada

THE Royal College of Dental Surgeons of Ontario, upon the suggestion of Dr. J. E. Black and other western men, arranged some months ago, that a series of post-graduate classes in prosthesis and Removeable Bridgework, be held by Professor W. E. Cummer at Winnipeg, Moose Jaw, Calgary, and Vancouver. The local arrangements for each class were placed in the hands of local dentists. Dr. Manly Bowles, Winnipeg; Dr. Elwood Cox, Moose Jaw; Dr. John Clay, Calgary, and Dr. T. W. Snipes, Vancouver, were appointed for this purpose and served most acceptably. Members of the C.A.D.C., at the local points were invited to be present as guests. The registration averaged about 50 at each centre and the greatest interest and enthusiasm prevailed.

School Dental Clinics in New York

ON the 21st of May, 1918, the Socialist members of the Board of Aldermen of New York City, introduced a resolution calling for the establishment of nine new dental clinics in the public schools of New York. The measure would create a Division of Oral Hygiene in the Department of Health which would take over the maintenance of the eight existing dental clinics and start at least nine new ones.

This is but another move in the direction of a state medical and dental service. There will doubtless always be an important place for private dental and medical practitioners, but a systematic, preventive, educational, health service must of necessity be established upon the foundation of a properly organized and regular state service.

INLAY GOLD.—I use coin gold exclusively. Two and a half dollar gold pieces in all my Taggart inlays. It is standard, and can be depended on to have the alloy a constant and well mixed blend, and the copper in coin gold makes it an ideal gold to resist mastication, as well as to hold a high burnish indefinitely. It is easy to cut in pieces, if you use the "two and a half pieces." They are very thin.—*Dental Review*.

The best life insurance is a
~~~~~ clean mouth ~~~~~



# Beware of Dangerous House Fly

KILL FLIES AND SAVE LIVES

**K**ILL every fly you can find and burn his body.  
The killing of just one fly NOW means there will be billions and trillions less next summer.

The conditions produced by the long and severe winter have made difficult the removal and proper disposal of refuse and filth accumulations that will facilitate the breeding of disease-germ-carrying flies.

Clean up your own premises; see and insist that your neighbors do likewise.

Especially clean "out-of-the-way places," and every nook and cranny.

Flies will not go where there is nothing to eat, and their principal diet is too filthy to mention.

## THE FLY IS THE TIE THAT BINDS THE UNHEALTHY TO THE HEALTHY

The fly has no equal as a germ "carrier"; as many as five hundred million germs have been found in and on the body of a single fly.

It is definitely known that the fly is the "carrier" of the germs of typhoid fever; it is widely believed that it is also the "carrier" of other diseases, including possibly infantile paralysis.

The very presence of a fly is a signal and notification that a housekeeper is uncleanly and inefficient.

Do not wait until the insects begin to pester; anticipate the annoyance.

The farming and suburban districts provide ideal breeding places, and the new-born flies do not remain at their birth-place, but migrate, using railroads and other means of transportation, to towns and cities.

Kill flies and save lives!



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, AUGUST, 1918

No. 8

## Technique of Efficient Application of Fixed Appliances in the Correction of Malocclusion

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*(This paper was written by Dr. Young in 1912, and appeared in "Items of Interest" at that time. Since that date many improvements have been made in the technique and forms of Orthodontia Appliances, and Dr. Young, practising as a Specialist, has, doubtless, somewhat changed the methods here advocated. The article is published in "Oral Health", not as the "last word" upon the subject, but as calculated to be of value to the general dental practitioner, who, unfortunately, knows too little of this work, particularly of the preventive side of orthodontia and the treatment in the more simple cases of malocclusion. Oral Health is indebted to "Items of Interest" for courtesy of publication and to Dr. George Grieve for generously loaning the electrotypes for illustrations.—Editor.)*

**F**IXED appliances of different varieties have been in use a great many years for the correction of malocclusion, but previous to the systematizing and standardizing of these appliances into a few simple, practical and efficient forms by Dr. Edward H. Angle, their application was very complex, impractical and inefficient.

The forms which he advocated for the correction of malocclusion comprised chiefly the expansion arch and molar clamp bands and the leading orthodontists of to-day are using these same simple forms for treatment of the simplest, as well as the most complex, cases of malocclusion.

Certain principles of fixation of appliances are involved in their



use; first, the inherent power in the appliance to hold to the teeth so that the patient cannot remove it, such as in the clamp band, and second, the use of phosphate cements to increase this holding power, as well as to prevent deterioration of tooth surfaces under the band, which otherwise would be possible.

With these general ideas of fixed appliances in mind, a description of these simple forms of fixed appliances, previous to the description of their efficient application for tooth movement, will not be inapropos.

#### CLAMP BANDS.

First in importance relative to the fixation principle is the clamp band, which by reason of the principle of the screw and nut, is mechanically most effective in being a "fixed" band, adding this power to that of the cement in holding to the tooth.

Clamp bands are furnished by the supply houses under the following designations: D, X, No. 1 and No. 2. The D band is used on the molars, and has a tube soldered to the buccal side to receive the end of the expansion arch. X bands are used on bicusps and also have a buccal tube. The No. 1 band is the same as the X band without the buccal tube, and the No. 2 band is the same as the D band without the buccal tube. The D bands are made in three sizes: small, medium, and large. In the proper adjustment of these clamp bands, and in their correct adaptation to secure greatest efficiency it is desirable that the following successive steps be pursued:

To facilitate the adjustment of the clamp band, it is advisable to get a slight separation both mesial and distal (if there be a tooth distal) to the tooth which the band is to encircle. This may be done by passing a heavy ligature wire through the interdental space, bringing the two ends together and twisting them tightly around the approximal contact points of the teeth to be separated. If this wire is worn for a few days there will be sufficient separation so that the band may be easily worked to place, except in some adult cases which may require some other method of tooth separation.

In these cases, as well as in younger cases, ligature silk has been found very efficient for this purpose, and is used as follows: A double strand of fine silk, engaging a loop of ligature silk No. 3, is passed by the contact points and the loop of the ligature silk is drawn through the interdental space to the buccal side, leaving the two free ends presenting lingually. The floss silk is then removed, leaving the ligature silk between the teeth. One end of the ligature silk is passed through the buccal loop, the other end is grasped and drawn taut and the two securely tied together around the approximal contact points, clipping the surplus ends. Through the shrinkage of the silk ligature, sufficient space for the easy fitting of the clamp band may be obtained in any case.



## TECHNIQUE OF ADJUSTING THE CLAMP BAND.

Fig 1 represents a D band as supplied by the trade. If the nut of this band were loosened up sufficiently to allow it to be forced over

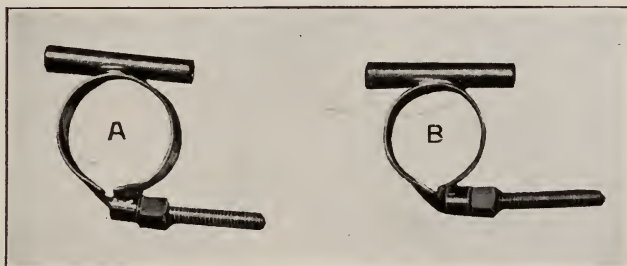


Fig. 1

the molar tooth, the edge of the band would impinge on the gum and cause unnecessary pain. To obviate this, the edge of the band that

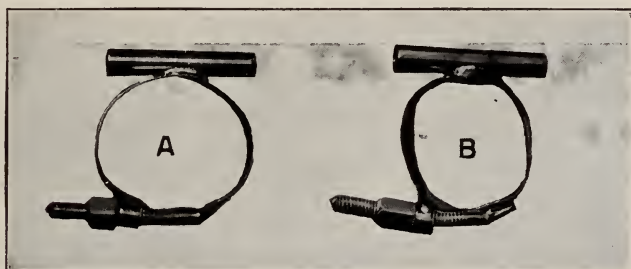


Fig. 2

presents to the gingiva should be shaped as shown in Fig 2, with a pliers designed for the purpose (Fig. 3), and the mesial portion of the band should be flattened in such a way that when forced over the tooth the lingual screw will lie very close to the lingual surface of the second bicuspid. A piece of dowel wood shaped as in Fig. 4 is very serviceable in forcing the band to place without bending the edge of the band. As soon as the band touches the gum so as to cause any annoyance, it should be clamped on the tooth by turning up the nut with a suitable wrench, thus making the band conform somewhat to the shape of the tooth. The nut must now be loosened up sufficiently to allow the band to be carried well toward the gingiva and then reclamped by turning up the nut.

The occlusal margin of the band should also be made to conform to the tooth, and the instrument (shown in Fig. 5) devised by the writer, has been found very suitable for the purpose. It has fine serrations on each of two sides to prevent it slipping while pressing





Fig. 3

the band to place. The edges are left smooth so that these parts of the instrument may be used as burnishers. The instrument is also very useful in removing various bands and in pressing plain bands to place when cementing them.

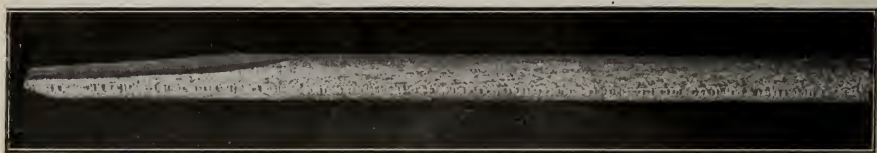


Fig. 4



Fig. 5

#### ADJUSTMENT OF BUCCAL TUBES.

The next step in the efficient adaptation of the clamp band is the determination of the position of the buccal tubes. If these tubes are not correctly placed, it will be impossible to properly adjust the expansion arch. The proper location of this tube is of such great importance that it would seem advisable that it should be sold separately, so that it might be soldered on after the band is fitted; for only in a small percentage of cases in which the tube is already attached will it be found to be in the correct position when the D band is properly adjusted.



Buccal tubes of some makes can be procured separately, but the best buccal tube for general use is that devised by Dr. Angle to accommodate the friction sleeve nut.

Wherever much expansion is required in the molar region the buccal tubes should be of such shape as to prevent the expansion



Fig. 6

arch rotating in them, thus obviating tipping of the anchor teeth (Fig. 6). The mesial end of the tube should be in such a relation to the band as to allow the nut on the arch to occupy the buccal embrasure between the anchor tooth and the tooth mesial to it, as in

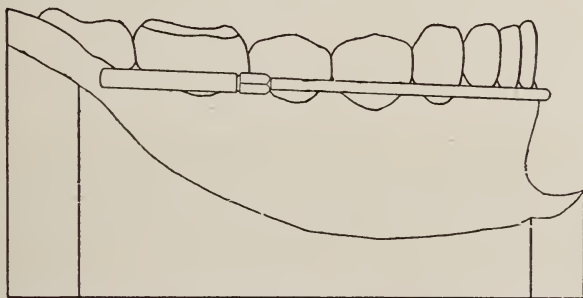


Fig. 7

Fig 7. If for any reason this is unpracticable, it is then advisable to solder the distal end of the tube to the mesio-buccal corner of the molar band, and thus bring the nut in the buccal embrasure one tooth mesial to the anchor tooth, as shown in Fig. 8, necessitating the use of a shorter expansion arch..

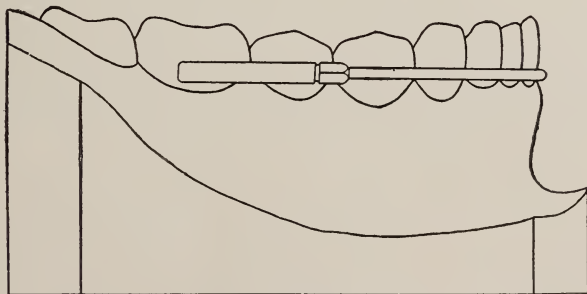


Fig. 8

The direction of the tube, with very few exceptions, should be such as to cause the arch when placed in the tubes to lie very close



to, if not in contact with, the buccal surfaces of the teeth mesial to the anchor tooth. The direction of the tube on each band should so harmonize that when one end of the arch is inserted into the tube that is to receive it, the other end of the arch will lie on the same plane, from both a vertical and a horizontal view, with the tube of the opposite side, unless for some good reason subsequently to be stated a different position is advantageous. The tubes should be so placed that, with few exceptions, no bending of the expansion arch is required in order to have it assume its proper position in the anterior region, i.e., at the gingival border, Fig. 9.

Where the anchor bands are fastened to the first permanent molars and the deciduous cuspids and molars are in place, it frequently happens that in order to prevent the expansion arch from impinging on the gum tissue, the direction of the buccal tubes must be such that it will be found necessary to bend each lateral half of

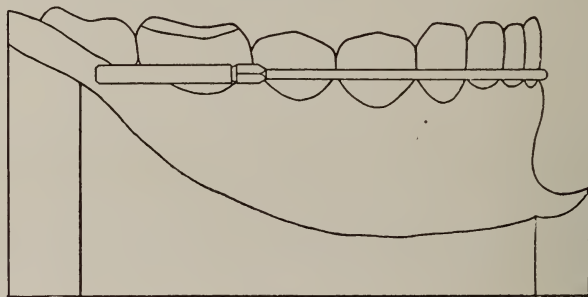


Fig. 9

the expansion arch just distal of the cuspids, in order that the front portion of the arch may assume its proper position in the incisor region.

In order to place the buccal tubes, as stated above, the band must be unclamped, the tube unsoldered, and re-soldered in the desired position. The band must then be reapplied and reclamped to be certain that the position of the buccal tube is correct. If found so, the band must now be removed and the tooth thoroughly polished so as to free it from all deposits and secretions.

#### CEMENTATION OF THE BANDS.

The bands may then be cemented on the teeth and securely clamped. As a cementing medium, Evan's Orthodontia Gutta Percha has been found very advantageous, as it is not necessary to have the tooth dry, and there is absolutely no danger of the gutta percha dissolving out.

If a zinc phosphate is to be used for cementing these bands in place, a semi-hydraulic cement should be selected. In using such a cement, it is not necessary to have the tooth perfectly dry; in fact,



the cement will be stronger and better if there is a slight moisture on the tooth. However, cement cannot be depended upon to adhere to a tooth from which all mucous has not been removed.

The cement is mixed by first pouring out the required quantity of liquid on the glass slab; a small portion of powder is added to this liquid from the bottle by rolling it between the thumb and finger. The powder should be thoroughly mixed by a suitable spatula before any more powder is added. The longer this mixing process is continued up to one minute, the slower the cement will set. Then little by little more powder is dusted out of the bottle and thoroughly spatulated until the proper consistency is attained. At this point of the procedure the tooth should be sprayed with some alkaline solution and the patient instructed to rinse the mouth out with an alkaline solution. This part of the work should be attended to by the assistant. The band is now filled with cement, the occlusal orifice of the band closed either with the finger, or better, a piece of No. 60 tin foil. This causes the surplus cement to escape from the gingival orifice of the band and removes considerable of the moisture, leaving just the amount required by such a semi-hydraulic cement.



The band on the opposite side is now adjusted in like manner. By means of the expansion arch, the direction of the buccal tube is now determined. This is done by inserting one end of the expansion arch into the buccal tube of the cemented band and holding the other end of it in its proper relation to the teeth on the opposite side and noting the relation this end of the expansion arch bears to the buccal tube that is to receive it. If found as in Fig. 10, and the resoldering of the buccal tube is neglected, when the expansion arch is sprung



into position it is inevitable that the molar on that side will be rotated. In some cases the buccal tubes can be readjusted without soldering by using an instrument devised by Dr. Joseph Grunberg, and shown in Fig. 11. When the tube is so adjusted that the arch will lie on the same plane with it from both vertical and horizontal view, the band is ready to be cemented in place. It is always well to mark one end of the expansion arch in some way that it can be placed in the same tube each time.

#### TECHNIQUE OF ADJUSTING PLAIN BANDS.

As it is found necessary to fit a number of plain bands, it is desirable that the material for these bands should be as thin as possible and yet be stable. Platinum and iridium, ten per cent. of the latter, has been found by a great many to be the most desirable metal for the purpose. It may be used as thin as .002 of an inch. Some operators have condemned this material on account of being too stiff. This stiffness can be overcome by annealing the roll of band material in an electric furnace. Fifteen-hundredths of an inch in



Fig. 11

width is a very serviceable size. Before shaping the band, one side of the strip of metal should be roughened by drawing it over a round file. The strip, with the roughened side presenting inward, should next be worked carefully around the tooth and well burnished to the lingual surface. It is then held with the thumb and finger and pinched with a suitable pliers so as to make it conform accurately to the shape of the tooth. After it is soldered in the usual way, a spur should be attached as desired for the case in hand.

The wire to be used for making such a spur should be as light as possible, and never should be heavier than the heaviest ligature wire, and if made from fifteen per cent. platinum and iridium, it can be lighter than this heavy ligature wire. Care should be exerted in placing the spur, so that when the ligature passes from the spur to the expansion arch, the tendency will be to withdraw the tooth from the socket rather than depress it therein. Bands of such thickness are so flexible that when soldered with pure gold they can be made to fit very closely nearly all of the ten anterior teeth in each arch. On fitting bands to partially erupted cuspids, it is often necessary to crimp the band by pinching on both the mesial and distal portions in addition to the regular lingual pinch usually required on a cuspid band. Bands for the upper laterals usually require a small pinch at



the disto-incisal angle. Where such extra crimps are necessary, solder should be used to unite the pinched surfaces and the surplus material trimmed away and the ragged edges filed and polished. After the tooth to be banded has been cleaned and polished and the cement prepared as described above, the band is filled with the cement and forced over the tooth. The lingual surfaces of the bands on each anterior tooth should be accurately burnished so as to leave as thin a layer of cement between the tooth and band as possible. This is for a double purpose: first, so as to lessen the probability of the lower teeth wearing through the bands on the upper anterior teeth; second, so as to force the cement around the approximal portions of the tooth where it may have been forced out by the band passing over the contact points. After this burnishing the band should be forced to its final position with a suitable driver by first pressing it on the lingual side of the band and then on the labial, using also light taps of the mallet to secure perfect adaptation.

#### BANDING BICUSPIDS.

For some years I have been rotating bicuspid just as soon as the two cusps are through the gum. It is not an easy matter to pinch a band on a bicuspid in such a position, but I have obviated the necessity of pinching the band in such cases by having previously made up a number of plain bands varying in size two hundredths of an inch in circumference. These bands I have in stock and properly labeled, ranging from eighty-hundredths of an inch to one hundred and ten hundredths of an inch in circumference. When a case presents with a bicuspid as described above, I select the size band I think will encircle the tooth. If upon trial it is found to be too small, a larger one is selected and so on until the correct size is obtained. In this way I find I can band such teeth without causing any pain, and it has also been found that a very few weeks of gentle force causes these teeth to rotate without any trouble at all, and also that two or three months' retention of teeth so rotated is sufficient. Two or three years of retention is not always sufficient when rotation is begun after root and bone are fully developed.

#### DEGREES OF FORCE IN THE EXPANSION ARCH.

Before considering in detail the application of the expansion arch, it becomes necessary first to designate the degrees of lateral spring force applied to the anchor teeth through the expansion arch, so that an intelligent use of this force may be comprehended. This lateral spring pressure on the anchor teeth may be denoted as follows:

A—Denoting passive condition, i.e., when in position, the expansion arch exerts no lateral force.

AL—Denoting lingual force, i.e., when in position, force is exerted lingually.



AB—Denoting buccal force, i.e., when in position, slight force is exerted buccally

AB2—Denoting greater buccal force than indicated by AB.

AB3—Denoting greatest buccal force.

Comparing the relative spring pressure of spring gold and German silver, the following caution should be observed:

Where spring gold is used for the construction of the expansion arches and great haste is not desired, it is never necessary to put more expansion in an arch than is necessary to move the teeth the required distance. Where base metals are used in the construction of the arch, it often becomes necessary at the beginning to put more expansion in the arch than the distance it is expected to move the teeth.

Now, for the sake of simplicity and clearness of description, the application of the expansion arch will be considered under several headings corresponding to the various tooth movements necessary to accomplish, taking up first the simple labial movement of the incisors, and then various combinations of tooth movements found necessary in everyday practice.

### 1. TO MOVE INCISORS LABIALLY.

This can only be accomplished, without carrying the anchor teeth buccally or lingually, by so placing the tubes on the anchor bands that they are parallel with each other. This necessitates a sharp bend (Fig. 12) in the expansion arch just in front of the nuts, in order that the arch may lie close to the cuspids and bicuspid, and not interfere with the soft tissues. The arch must be bent so as to pass into the tubes without exerting any lateral spring, denoted

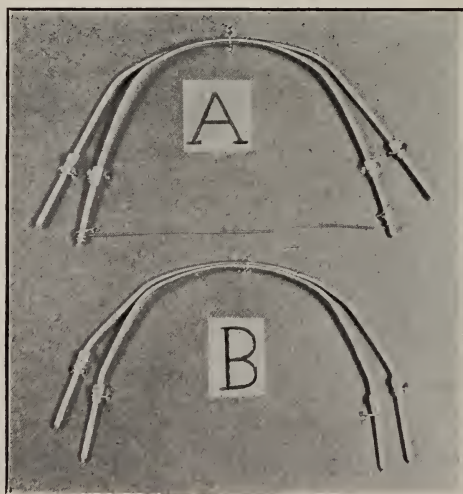


Fig. 12



Exp. A. When one end of such an arch is inserted into the tube on the anchor band, the other end should lie parallel when passive with the tube which is to receive it. The incisors to be carried forward are ligated to the arch and as the nuts are turned up this movement is accomplished.

If the incisors are unlocked or the molars are not sufficiently fixed to resist such pressure without tipping distally, as sometimes happens in Class 11, Division 2, it is advisable to solder hooks on the arch in front of the nuts and from these use intermaxillary rubbers on each side to hook well forward on the lower expansion arch. In this way the molars can be left undisturbed and they will be more useful as anchorage when shifting the lower teeth forward.

## 2. TO MOVE THE INCISORS LABIALLY, AND THE CUSPIDS, BICUSPIDS AND MOLARS BUCCALLY.

In order to accomplish this it is only necessary to so shape the expansion arch that when the labial and buccal surfaces of the teeth are brought in contact with it they will have assumed the desired position or the shape of the ideal dental arch.

This is so simple that it would seem impossible for any one to meet with any difficulty, but it is rare indeed for a beginner to properly adjust an arch for such a purpose. The tubes on the anchor bands must be so placed that when one end of the expansion arch is inserted in the tube the other end would, when passive, lie on the same plane, from both a vertical and horizontal view, with the tube which is to receive it. If the dental arch is to be lengthened to any extent, which is done as in No. 1, it will also cause expansion in the region of the anchor teeth. Failure to realize this fact is responsible for over expansion in the molar region.

## 3. TO MOVE THE INCISORS LINGUALLY, AND THE CUSPIDS, BICUSPIDS AND MOLARS BUCCALLY.

This movement is often required in the upper arch in the treatment of Class 11, Division 1. The adjustment of the tubes on the anchor bands and the shaping of the expansion arch should be the same as in No. 2, having Exp. AB2. On trial on the model it will be found when passive to stand some distance from the cuspids, bicuspid and molars. When this expansion arch is inserted it should stand away from the cuspids and bicuspid and should be ligated to these teeth first. If the arch is not too heavy (.038 inch is sufficient) it can be brought into contact with these teeth and will be carried away from the incisors. The nuts should now be loosened so that the arch may be forced back until in contact with the incisors. If any of these are to be rotated they should be properly ligated to the arch, otherwise no ligating of the incisors is necessary. As the cuspids, bicuspid and molars on each side are carried buccally by

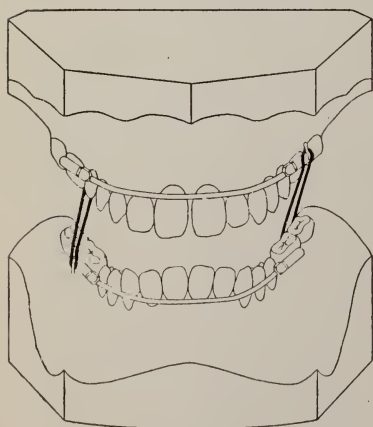


the spring of the arch, the incisors will be carried lingually. An expansion arch so applied is practically automatic and may be allowed to go a month without attention. If nothing breaks, the worst that can happen is to carry the incisors too far lingually, and this can be readily counteracted by turning up the nuts on the arch. Note how the force is reciprocated from one side to the other and also to the anterior teeth.

#### 4. TO MOVE THE CUSPID, BICUSPIDS AND MOLARS ON ONE SIDE, BUCCALLY.

Usually when such a movement is necessary in either dental arch, the malposed teeth are inlocked by those of the opposing jaw. In order to overcome this inlocking without displacing the teeth on the opposite side, some precaution is necessary. It is obvious that it will not do to depend on the reciprocal force of the expansion arch, as in No. 3.—The attachment to the teeth on the normal side should be as nearly stationary anchorage as possible.

This may be accomplished in various ways, but the one here described seems the most applicable. The cuspid on the normal side is fitted with a plain band and a rigid wire is soldered from the end of the screw of the clamp band to the cuspid band. This necessitates care being used while cementing these bands in place, but the cuspid tooth, being easy to fit, there is little danger of the band coming loose. The buccal tube is so shaped that the expansion arch cannot rotate in it, and should be so placed on the band that the expansion arch will lie close to the bicuspid and cuspid on the normal side. The other end of the expansion arch should lie in the same plane, from both a vertical and a horizontal view, when passive, with the buccal tube which is to receive it, and should stand away the distance it is necessary to move the malposed molar buccally.



FRONT VIEW

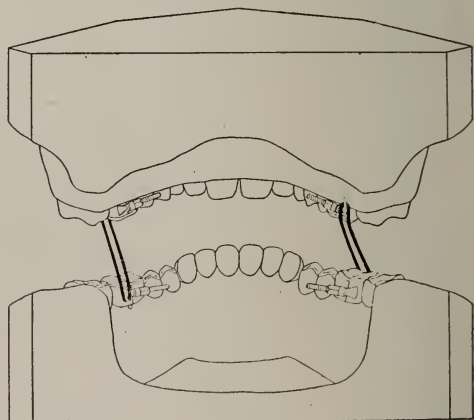


Fig. 13

REAR VIEW



The arch is then inserted into the tube with the nut so placed that the arch lies very close to the incisors. As the inlocked molar moves buccally, the nut on the arch on this side should be turned up from time to time, so that the arch does not press on the incisors. If this end of the arch should tend to slip forward out of the buccal tube, it can be prevented by the adjustment of a rubber ligature over the back end of the tube and over a small hook soldered on the arch in front of the nut. When the molar reaches its proper position the second bicuspid may be ligated to the arch, and so on, one at a time, until all the malposed teeth are brought into proper position. In this way it will be seen that four teeth on the normal side, two of which must move bodily if they move at all, are pitted against the inlocked molar. Subsequently, this molar can be straightened up by the proper application of retaining appliances.

Further reinforcement of this anchorage can be obtained by the use of intermaxillary rubbers on each side (Fig. 13).

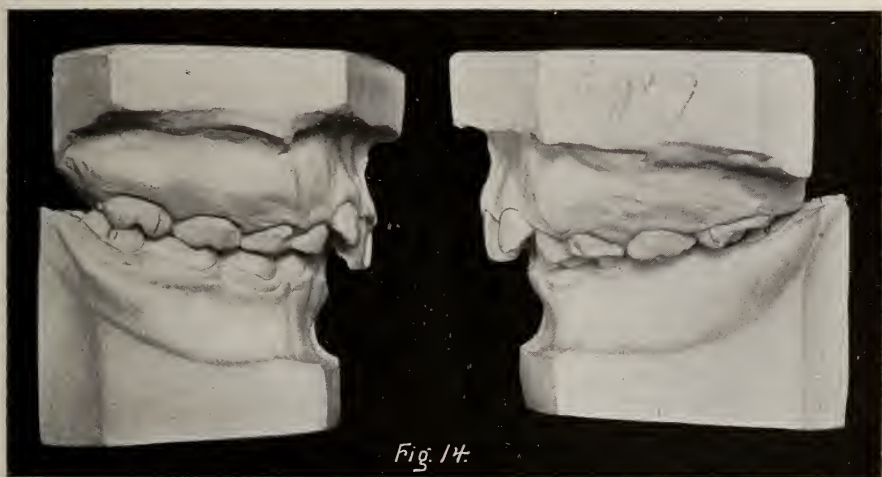


Fig. 14 shows profile views of a case requiring such application of appliances. Fig. 15 is the front view of the same.

##### 5. TO MOVE THE CUSPIDS AND BICUSPIDS BUCCALLY ON EACH SIDE.

This can be accomplished without disturbing the other teeth by so placing the buccal tubes that when the expansion arch is inserted it will rest passively in them. The expansion arch should be of the shape and dimension that the dental arch is to assume. It will thus be found to be some distance from the malposed teeth. By the use of silk ligatures these teeth can be caused to move buccally until they come in contact with the expansion arch. Or, if a light expan-





sion arch is used, it may be ligated with wire so as to rest in contact with the cuspids and bicuspid and thus obviate interference with the soft tissues.

This necessitates the turning back of the nuts on the expansion arch, the front portion of which should be allowed to proximate the incisors. As the malposed teeth move buccally these nuts should be gradually turned up to prevent carrying the incisors lingually.

Obviously this would cause some temporary displacement of the anchor teeth. To prevent this, the expansion arch should have Exp. AB at the beginning, and when the cuspids and bicuspid begin to move it should be reduced to Exp. A.

#### 6. TO MOVE INCISORS LINGUALLY AND THE CUSPIDS AND BICUSPIDS BUCCALLY.

In order to do this without disturbing the anchor teeth, if for any good reason the first molars are to be used as anchorage, it is advisable to have a swivel attachment of the buccal tubes to the anchor bands, which will be described under the head "rotating of molars." The simple way to bring about such a movement is to use X bands on the second bicuspid and treat as in No. 3.

#### 7. TO ELONGATE BICUSPIDS.

This can be accomplished by use of an auxiliary spring soldered well to the distal end of the buccal tube, allowing it to pass forward occlusally of the expansion arch. With the expansion arch in place, and properly ligated to the cuspids and incisors, this spring is ligated to the bicuspid in infra-occlusion. It is usually well to band these teeth so that the ligatures may be attached to proper hooks.

Fig. 17 shows application of a light arch, as described by Dr. Case, to accomplish these same tooth movements.



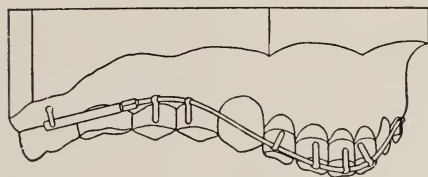


Fig. 17

Fig. 18 shows profile and front view of a case requiring such treatment. Fig. 19—the same after treatment. Fig. 20 is the profile and front view of the face before treatment, and Fig. 21 the same views after treatment.

### 8. TO ELONGATE ANTERIOR TEETH.

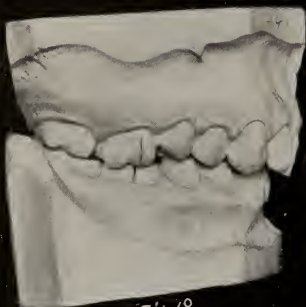
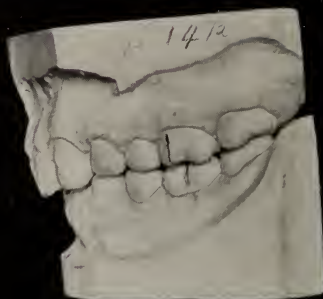
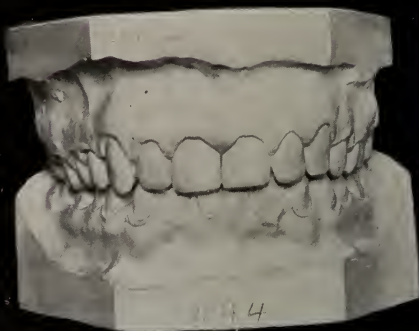
Infra-occlusion is found in various sections of the dental arch. In this connection infra-occlusion refers to teeth that are so placed that it is impossible for them to be brought in contact with the teeth of the opposing dental arch. The incisors are more often in infra-occlusion than the other teeth, and the upper incisors more often than the lower ones. Where both upper and lower anterior teeth require elongating, the application of intermaxillary rubbers is of great assistance.

The teeth to be acted on should be fitted with bands which have on their labial surfaces suitable spurs to engage the arch, so that it cannot be moved toward the incisal edges of the teeth when the mouth is open and the rubbers put on stretch. These rubbers should be applied in a triangular way. To accomplish this, spurs are soldered to the upper expansion arch in the region of the distal surface of the upper lateral incisors. These spurs point toward the gingiva. On the lower expansion arch spurs are also soldered, pointing toward the gingiva and may be placed directly under the upper spurs or either mesial or distal to this point as desired.

The arches are adjusted so that when passive they will rest just above the spurs on the anterior bands. If such an arch is sprung so as to rest below these spurs (i.e. gingivally) the tendency will be to tip the molars mesially and elongate the anterior teeth. Sometimes it is advisable to have swivel attachments of the buccal tubes to the clamp bands, and then by the use of intermaxillary rubbers the molar tipping can be obviated.

Where the lack of vertical development is confined to the anterior teeth in one dental arch, the rubbers should not be worn. The tooth on each side most mesial and not in infra-occlusion should be banded and a wire soldered from it to the screw of the clamp band, as described in No. 4. This prevents the forward tipping of the anchor teeth and permits the expansion arch, which should be as light and elastic as possible, to spring from the front end of the buccal tube on each lateral half to the point where it engages the



*Fig. 18.**Fig. 18.**Fig. 18.**Fig. 19.**Fig. 19.**Fig. 19.*







spur most distal. Owing to the length of spring thus obtained, the delicacy of adjustment is much greater and the efficiency increased.

9. TO ROTATE THE ANCHOR TEETH, CAUSING THE DISTO-BUC-  
CAL CORNERS TO MOVE BUCCALLY.

It is rare indeed to find the first molars, either upper or lower, requiring such a movement. When desired it can be easily accomplished by so placing the buccal tubes on the anchor bands that when one end of the expansion arch is inserted in the tube the other end of the arch, instead of being on the same plane with the tube from a vertical view, presents buccally towards its distal end. If both molars are to be equally rotated the arch should be removed and the end that was free in the first trial inserted in the tube on the opposite side.

The end that is now free should bear the same relation to the tube which is to receive it as the first did. When the arch is inserted it should stand away from the bicuspid on each side, and as the distal ends of the arch are caused to spring lingually they exert a constant outward pressure and thus rotate the molars. If necessary, by ligating the arch to the bicuspid on each side, the pressure on the molars can be increased and the rotation hastened.

10. TO ROTATE THE ANCHOR TEETH, CAUSING THE DISTO-BUC-  
CAL CORNERS TO MOVE LINGUALLY.

This movement is very often required in order to establish occlusion, and, unlike No. 9, is often very difficult to accomplish. In young patients it can usually be done by putting a sharp bend in the expansion arch just in front of the nuts, causing the distal ends of the arch to present lingually (B Fig. 12). An arch so shaped tends to work out of the tubes, and if not ligated to the anterior teeth it

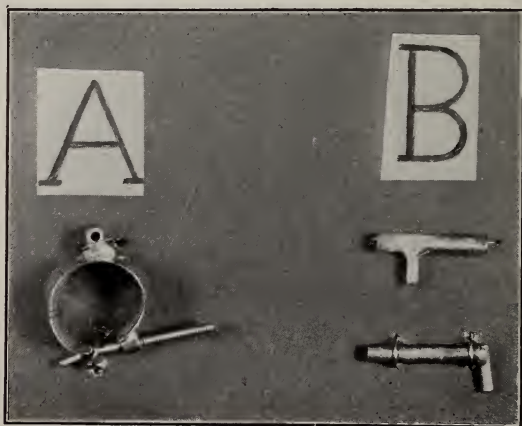


Fig. 22



should be held in place by means of a rubber ligature on each side, as described in No. 4.

In older patients, and especially where the tooth mesial to the molar to be rotated has been lost, other means must be resorted to. The D band, with the screw directed distally, is fitted to the molar to be rotated. It is then removed, the buccal tube unsoldered, and to this band is soldered a suitable round tube in such position as to lie over the mesio-buccal corner of the tooth, and be parallel with its long axis when the band is cemented and clamped in place (Fig. 22a). To the buccal tube is soldered a suitable wire in the desired position (Fig. 22b), in such relation that when it is passed into the tube on the band the buccal tube will assume the proper position to receive the expansion arch, giving a hinge attachment between the arch and the band.

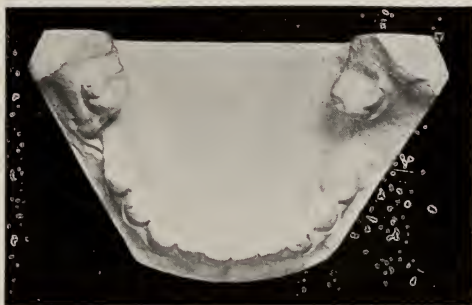


Fig. 23

Where the tooth mesial to the molar to be rotated is missing, as in Fig. 23, a suitable hook can be soldered to the expansion arch in such a position that a rubber ligature can pass from the screw on the molar band to this hook without exerting pressure on the tooth in front of the space. If this arrangement is used on each side it will be observed that we have established reciprocal force to rotate these teeth, and it is doubtful if any tooth can resist this constant pull of rubber.

Where no tooth is missing, a suitable wire of spring gold can be soldered to the molar band in such a position as to present lingually as it passes forward in the bicuspid region. This may now be ligated to the expansion arch, and caused to lie in contact with the bicuspid. From time to time, as the ligature is renewed, this lever may be bent lingually before the new ligature is applied.

#### 11. TO MOVE UPPER INCISORS LINGUALLY.

The adjustment of the buccal tubes and the expansion arch should be the same as in No. 1, except that the sharp bends in the arch should be some distance forward of the nuts. Owing to the fact that teeth move forward so much more easily than they move



backward it becomes necessary to resort either to occipital or inter-maxillary anchorage. If the latter is employed, the lower expansion arch should be adjusted in such a manner as to establish as nearly as possible stationary anchorage. This will be described later.

### 12. TO MOVE MOLARS AND BICUSPIDS LINGUALLY.

While this movement is not often required, it has been considered difficult to accomplish, but this is not so if the spring of the expansion arch is combined with the constant pull of rubber. A stiff arch should be employed and should be so shaped that in order for it to be inserted into the buccal tubes it must be sprung buccally. Such an arch will always tend to move forward, unless ligated to the anterior teeth. To do this is a mistake unless the incisors are to be moved labially or rotated. The expansion arch should be held in place, i.e., so as to press against the buccal surfaces of the bicuspid, by rubber ligatures, one on either side, passing from suitable hooks attached to the expansion arch over the distal ends of the buccal tubes.

If it is desirable to move these teeth bodily it can be done by using the elliptical tube on the anchor band and a plain band on the first bicuspid, uniting the two by soldering a piece of stiff wire from one to the other on the lingual side, as described in No. 4. If this is done on either side and the arch inserted and worn long enough, the teeth will be carried bodily lingually.

### 13. TO STRAIGHTEN UP MOLARS TIPPED MESIALLY.

If but one molar is tipped, the tube on the anchor band for the normal side should be placed in the usual way. The other should be so attached to the anchor band that when the expansion arch is inserted in the tube on the normal side, the other end of the expansion arch should be on the same plane with the tube that is to receive it, from a vertical view, but from a horizontal view the mesial end of this tube should present toward the gingiva (Fig. 24). If this arch is now sprung in place the tendency will be to tip mesially the normal molar and at the same time straighten up the tipped molar.

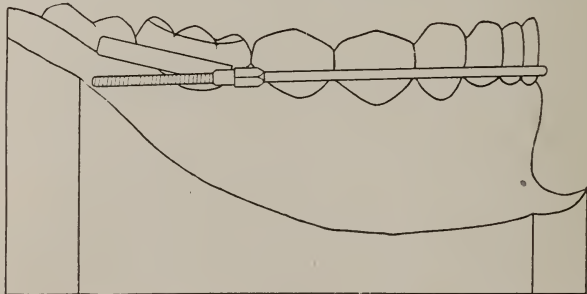
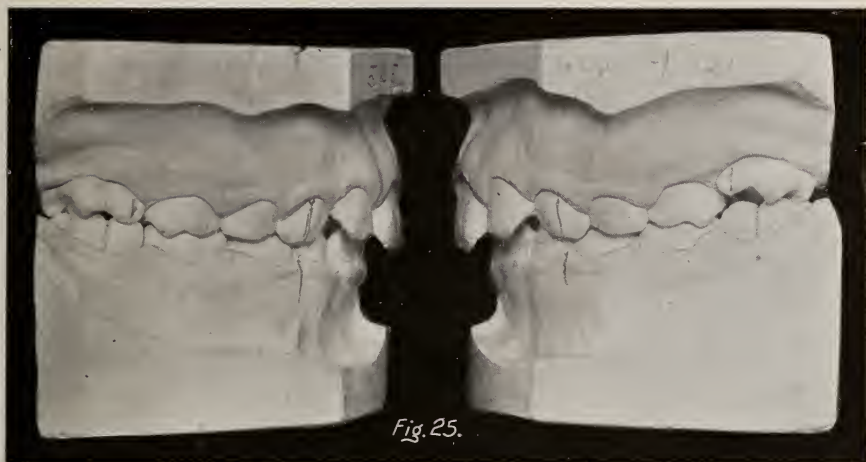


Fig. 24





Owing to the difficulty of depressing teeth in their sockets, the normal molar scarcely moves at all and the tipped one is made to assume its normal position. Fig. 25 shows a case requiring such treatment.

When a molar on each side of the same dental arch is tipped, the tubes should be placed so that when the arch is inserted the front portion will lie, when passive, at least one-eighth of an inch below the gingival border (Fig. 26). This arch should then be sprung to

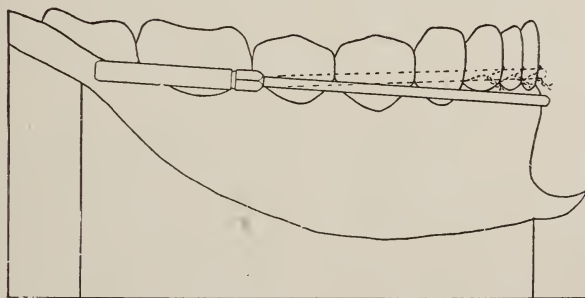


Fig. 26

the proper position and firmly ligated to the cuspids and incisors. This will tend to tip the molars back and at the same time depress the anterior teeth. The latter movement will be so slight, however, that it will not be noticeable and as soon as the pressure is removed they will readily return to their former positions.

This manner of adjustment is also used to create stationary anchorage on the lower dental arch where desired but in such cases the expansion arch, when inserted into the tubes, should lie, when passive, closer to the gingival border of the anterior teeth than where it is desired to tip the lower molars distally.



#### 14. THE ADJUSTMENT OF THE ARCHES AND THE APPLICATION OF INTERMAXILLARY RUBBERS IN THE TREATMENT OF CLASS II, DIVISION 1.

It is always advisable to have both expansion arches in place when intermaxillary force is to be applied. Two methods may be employed, according to the movement required.

Where it is thought advisable to tip the molars distally, so as to place the inclined planes of these teeth in harmony with the molars of the opposing jaw, the expansion arch is adjusted in such a manner that as these teeth are tipped distally they will be in proper relation mesio-distally with the lower.

The upper arch should have suitable hooks, so placed that when the arch is inserted they will be on a line with the distal surfaces of the upper laterals. Over these, rubber ligatures are passed to the distal end of the buccal tubes on the lower D bands. One rubber on each side is sufficient at the beginning, and if more force is required later the number may be increased.

As the molars tip distally, the arch will require lengthening by turning up the nuts, so as to keep the front portion of the arch free from the incisor teeth. It will also be found necessary either to re-adjust the tubes on the anchor bands, or to put a bend in the arch on either side, so that the front section will be in proper position on the anterior teeth, which is at the gingival border. The lower arch is adjusted, as previously described, to create stationary anchorage.

This method of treatment depends very largely on efficient resistance of the molars to carry the lower teeth forward as they gradually assume their upright positions.

The other method is to bring about a mesial movement of the lower teeth, without tipping the upper molars distally. To do this the upper expansion arch should be adjusted as in No. 3. The lower expansion arch may be used as has been described, or one or more of the front teeth may be ligated to the arch and moved forward by turning up the nuts on the arch, then, according to the case, two or

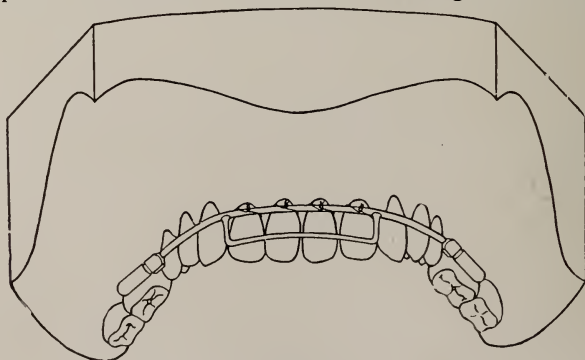


Fig. 27



more teeth may be ligated, and so on, until all the lower teeth are carried forward to their normal positions.

An auxiliary wire soldered to the front portion of the lower expansion arch, so as to engage the labial surface of the incisors and cuspids close to the incisal edge, has been found of value to prevent tipping of these teeth in their forward movement (Fig. 27). This wire should be of spring metal and not over .030 of an inch in diameter, so that it may be occasionally bent in such a manner that the arch will stand away from the labial surface of the incisors and cuspids when the auxiliary wire is in contact with the teeth.

In the treatment of a sub-division of the First Division of Class 11, the intermaxillary rubber should be worn on but one side, and may be adjusted according to either method just given for the treatment of the full division.

#### 15. THE ADJUSTMENT OF THE ARCHES AND THE APPLICATION OF INTERMAXILLARY RUBBERS IN THE TREATMENT OF CLASS 11, DIVISION 2.

As these cases usually require that the lower bicuspid and molars be elevated, it becomes necessary to use a bite plane of some description, so as to prevent the back teeth from meeting when the jaws are closed.

As in No. 14, two methods may be employed, but the distal tipping of the upper molars in this case is far less indicated than in the treatment of the Division 1. It is preferable to use intermaxillary force, as stated in No. 1, to move the upper incisors forward, and later reverse the application of the intermaxillary elastic so as to

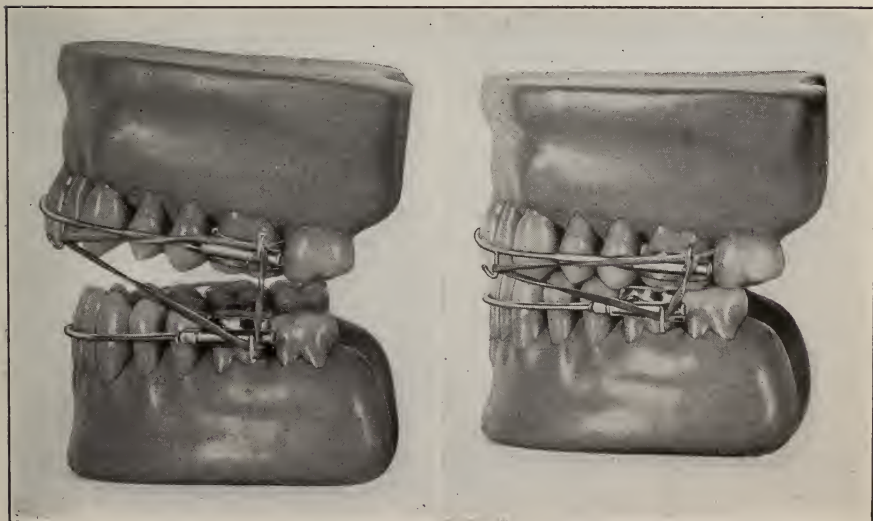
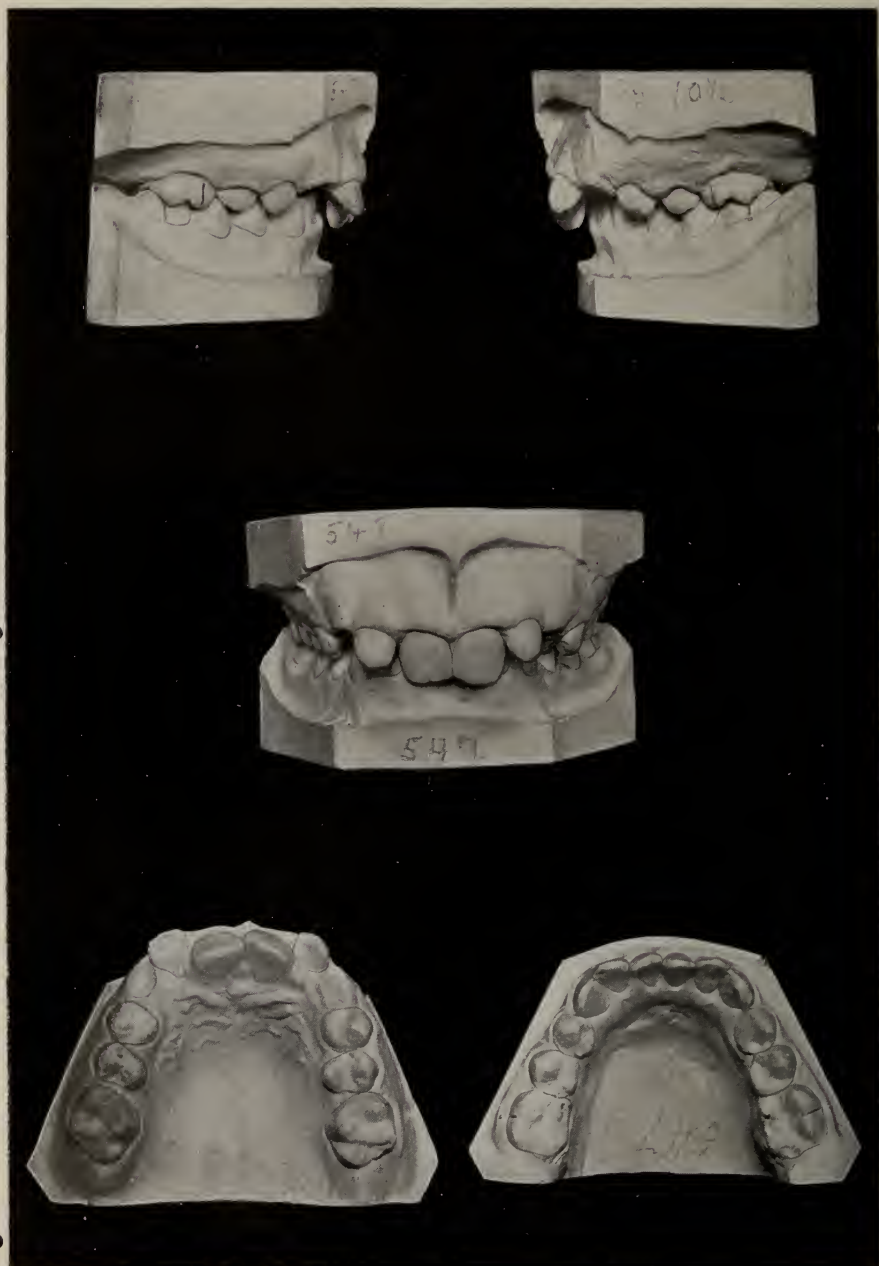


Fig. 28.





3 Upper Cuts—Fig. 29

2 Lower Cuts—Fig. 30





3 Upper Cuts—Fig. 31

2 Lower Cuts—Fig. 32





Figs. 33 and 34.



carry the lower teeth forward and at the same time elevate the bicus-pids and molars.

This can be done by soldering suitable hooks on the upper buccal tubes so that the intermaxillary rubbers can be applied in triangular shape, i.e., to pass from the hook on the arch in the lateral region to the hook on the buccal tube on the upper and then over the distal end of the buccal tube on the lower on each side (Fig. 28). If necessary to increase the intermaxillary force a second rubber may be employed on each side, but in the usual way, i.e., from the hook on the upper arch over the distal end of the buccal tube on the lower. When two rubber ligatures are worn in this way, the one from the lower to the upper should be put on first. If this is not done the rubber ligature worn in the triangular shape is very liable to break.

The next figures show a case of this kind treated as described above. Fig. 29 shows profile and front view of models of the case before treatment; Fig. 30, occlusal view of the same; Fig. 31, profile and front view when retention was applied; Fig. 32, occlusal view of models at this time; Fig. 33, profile and front view of face before treatment, and Fig. 34, same view after treatment.

In the treatment of a sub-division of this class it is only necessary to apply the rubbers on the side that is abnormal.

#### 16. THE ADJUSTMENT OF THE ARCHES AND THE APPLICATION OF INTERMAXILLARY RUBBERS IN THE TREATMENT OF CLASS III.

In order to prevent, as much as possible, in these cases the labial tipping of the upper anterior teeth in moving them forward, an auxiliary wire should be soldered to the front portion of the arch, as described in No. 14. In pronounced cases of this class it will sometimes be necessary to elongate the anterior teeth as they are carried forward.

The application of the lower arch should be such as to embrace, as nearly as possible, all the lower teeth as a unit of anchorage, but it is impossible to establish stationary anchorage to the same degree as where intermaxillary force is applied in the opposite direction.

To accomplish this the lower cuspids are banded and to these is soldered a labial wire. On this labial wire are soldered four small U-shaped pieces made from irido-platinum round wire .022 of an inch in diameter, so as to engage each of the lower incisors on the labial surface just under the free margin of the gum. On the lingual side of each cuspid band is soldered a short round tube, the bore of which is .036 of an inch. To the lingual screw on each molar band is soldered an irido-platinum wire to pass forward and so bend as to fit in the tube on the cuspid band on each side, and should enter this tube from the gingival aspect.

The expansion arch is now adjusted with Exp. A, so as to rest as nearly as possible in contact with the teeth, and securely ligated to them. In this way very little tipping of the molars can take place.



# ARMY DENTISTRY

By authority of Lt.-Col. Thompson, A.D.D.S., M.D. No. 2  
This Department is Edited by Harry S. Thomson, Captain C.A.D.C.

- ¶ *The unselfish and efficient work of the Canadian Army Dental Corps is not yet fully understood or appreciated either by civilian dentists or the public generally.*
- ¶ *Public appreciation and recognition of Dentistry, during the period of the war, certainly depends more upon the ideals and accomplishments of Army Dentists than upon those of civilian practitioners.*
- ¶ *The Dental profession and the Dental Corps are not distinct bodies. Their interests are identical. The one is part of the other.*
- ¶ *In the conduct of this Department, Captain Thomson will be glad to receive assistance from all who are willing to help, and will appreciate receiving personal notes, suggestions, or manuscript describing interesting cases in Army Practice.*
- ¶ *Address communications to Captain H. S. Thomson, C.A.D.C., North Toronto Orthopedic Hospital, Toronto.*

IT must be gratifying to the Dental profession all over Canada to find that more recently, from time to time, there appears in our daily press, cable news from the other side complimenting the Canadian Army Dental Corps on the work they are doing in England and France. A recent item appeared on July 10th, which contains one or two items which are worthy of our consideration; particularly the part which says, "What this means to the comfort of the men and their general health, will be especially appreciated in Canada where the importance of the care of the teeth is so well understood." Such an item as this reflects great credit upon our professional standing and attaches additional value to our educational work; it shows that our efforts have not been in vain, and that we have established a standard in Canada higher than has been obtained on the other side. Another sentence of particular interest is that which refers to the New Zealand Forces adopting our measures. This shows that a properly instituted propaganda knows no bounds and should govern us in the maintenance of the highest point of efficiency in all our corps work so that we may always be proud to have other army systems adopt our methods.

The war has given us an opportunity to show what Canadians really are doing in dentistry; and a jump of eleven thousand miles across the ocean from Canada to New Zealand proves that carefulness of detail and thoroughness of method knows no National boundaries, and widely extends our field.

Below you will find extracts from the paragraph referred to above:

The following has been received by the Militia Department from Sir Edward Kemp, Minister of Overseas Military Forces:—

"It will be of interest to the Canadian public to know that every man in the Canadian army in England is 'dentally fit.' One of the first things that happens to a soldier on his arrival in England is to



have his mouth examined. A nominal roll is then made out, and the details of the dental conditions are set after each name.

"At the training camp all the men are paraded to dental clinics and are made 'dentally fit.' What this means to the comfort of the men and their general health will be especially appreciated in Canada, where the importance of care of the teeth is so well understood.

"Before going to France all the men are again paraded. They are given a thorough examination and are made 'dentally fit' before they are allowed to go to the front.

"The special clinic equipped and donated by the Ontario Government at Orpington Hospital is doing specially effective work in connection with men who have been wounded in the face, who have sustained fractured or splintered jaws, or other complex injuries.

"By microscopical diagnosis and systematic treatment, together with the aid of segregation to stop the spread of the infection, the ravages of 'trench mouth,' which were assuming disquieting proportions, have been brought under control. There were 2,000 cases early in the year, and it was spreading, and the number of cases increasing. There are now less than 200 cases.

"In this connection it is interesting to note that the measures taken by the Canadian dental authorities were placed at the disposal of the New Zealand forces, who expressed warm appreciation. They are inaugurating the system in New Zealand, where 'trench mouth' has assumed serious proportions among returned soldiers."

\* \* \* \* \*

Perhaps no man in M. D. No. 2 has a better idea of the inner workings and organizations of War Dentistry than Dr. Harold Clark. Dr. Clark's interest and enthusiasm were particularly beneficial during the early days, and through the formation of the Canadian Army Dental Corps. His influence at that time, with "The Powers that be," at Ottawa, was more or less responsible for our organization into a separate unit. Previous to the formation of the Corps Dr. Clark had his share of civilian dentistry, and by his enthusiasm encouraged many others to also carry on. His enthusiasm has never waned, and to-day he inspires us all with his interest and confidence.

Below will be found a letter which he has addressed to the editor, congratulating us on the War Dentistry Department in Oral Health.

Toronto, July 18th, 1918.

Dear Mr. Editor:—

I would like to compliment you on the wisdom of your new department in "Oral Health"—War Dentistry. It is a great new thing that has come into our profession, and its influence on the future of dentistry is beyond the knowledge of the wisest. But it will be very great.



A large proportion of the profession to-day have a very meagre conception of what has already been done. Not only should every dentist know the value of dentistry to the army, but the public, through the dentist and through the press, should know the achievements of the C. A. D. C. They should know the enormous amount of work done for the soldiers; the comfort, health, and well-being that has resulted; and the surgical miracles of facial restoration that have been performed through the enthusiasm, ingenuity and devotion of the members of the C. A. D. C. to the unfortunate heroes whose faces have been shot to pieces and made so hideous that even their children scream and run away at the sight of them.

Many of us remember the beginnings of Army Dentistry in this war. Thousands of men with good fighting stuff in them were eager to enlist but were rejected because they couldn't qualify for the old-time dental requirements of the army. The dentist knew he could make these men fit. A number of civilian dentists in Toronto undertook to keep a half dozen chairs at the Exhibition Camp Clinic manned seven days a week. The men dentally unfit were cared for in this way literally by the thousands and very soon the military chiefs realized and appreciated the new value of the dentist in the army. The C. A. D. C. was not as yet in existence. The civilian operators were under the direction of the A. M. C. and were practically limited in their services to amalgam and cement fillings, extractions and dentures. Anything that would keep the men comfortable for the period of a year or two at most would surely bring them back from the short (?) war that had just commenced. The need of a separate corps became increasingly apparent to the profession. This need was brought to the attention of the Minister of Militia, Sir Sam Hughes, and the corps was soon an accomplished fact. The development of the service rendered the army by the corps from that time to the present will always be an important chapter in the history of dentistry.

The early estimate of two years' duration for the war is now doubled and the end is not yet in sight. Now, nothing in dentistry is too good for the soldier. The best materials and equipment are demanded; the most daring operations have been undertaken for the restoration of mutilated jaws and faces, not only in France and England, but right here in Canada. When we remember that one out of every thirteen of our population will have come under the care of the C. A. D. C. and will come back knowing the value of dentistry to his health, comfort and appearance, surely it is of very great importance that the general public should know what the army dentists are doing. It is an achievement that is second only to that of the A. M. C. There are many ways, perhaps, that the public may be reached but the best way of all is through the dentist; and there is



no way better to reach him than through the pages of "Oral Health." Hence my pleasure in your new department—War Dentistry.

Cordially yours,

HAROLD CLARK.

### Army Dental Club; Military District No. 1

THE Dental Officers of Military District No. 1, have organized an "Army Dental Club," the object of which is to promote the welfare of its members professionally and socially.

So far as we know this is the first organization of its kind in Canada. The Club meets fortnightly, and its members are taking an enthusiastic interest in its proceedings.

It is proposed to invite outside dentists occasionally to address the Club on dental subjects. At the other meetings the members will deal informally with, and exchange ideas upon, questions relating to their own special work.

At their first regular meeting Captain Hayden took up the subject of "Dental Radiographs," exhibiting a very good collection of radiographs depicting the very many abnormal conditions found in convalescent hospital practice. At the second meeting "Sterilizing" is to be taken up in a paper by Lieut. J. O. McCutcheon, and to be discussed by the members.

Dental Students who are serving in No. 1 detachment are invited to attend these meetings so they may keep in touch with the newer developments in dentistry.

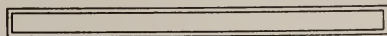
Names of officers are as follows:—

Hon. Presidents: Brig.-Gen. Shannon, G.O.C., M.D. No. 1; Lieut.-Col. H. D. Smith, G.S.O., M.D. No. 1; Dr. M. A. Ross Thomas. President: Lieut.-Col. F. P. Shaw, A.D.D.S., M.D. No. 1; Vice-president: Capt. W. Y. Hayden; Secretary-Treasurer: Capt. T. D. Campbell; Executive Committee: Capt. J. N. Dunning, Capt. J. M. Deans, Capt. R. G. McMillen. Ways and Means Committee: Capt. F. G. Humphrey, Lieut. J. O. McCutcheon, Lieut. F. M. Deans. Propaganda Committee: Capt. R. G. McMillan, Lieut. K. Berry, Lieut. M. H. Hagey.

W. Y. HAYDEN,

Captain,

A.-A.D.D.S., Military District No. 1.





# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## ANESTHESIA IN DENTISTRY.

A PAPER of unusual interest to dentists appears in the June issue of "The Dental Review." It is the report of an address given before The Odontological Society of Chicago in March, 1918, by Dr. Arthur E. Smith, of Chicago. Dr. Smith is a special instructor in Oral Surgery and Anesthesia in Loyola University, and University of Tennessee, also Oral Surgeon, House of Good Shepherd, Chicago. The subject of the paper is "Anesthesia in Dentistry." Few papers have been published in our dental journals that give evidence of as careful preparation as does this one of Dr. Smith's, and it has been highly spoken of by such authorities as Drs. Johnson and Brophy.

In reviewing this paper it is possible to suggest only a few of the important topics treated by the essayist; and from these the reader may get an idea of the exhaustive investigations carried on by Dr. Smith. Before taking up the discussion of the present status of anesthesia, the essayist indulges in a "brief retrospect." The early teachers of dentistry are spoken of as "giants in intellect, filled with the fire of love and enthusiasm for their chosen field." A great deal of the credit for the advancement in scientific research both in general and local anesthesia belongs to these men and those whom they have taught. 'Tis true that the search for some agent by virtue of which pain might be alleviated, dates back to the earliest times of Medicine, yet the pioneers in Dentistry may rightly claim a large share in the successful results. Dentistry, although a new profession as compared with Medicine, can claim the distinction of having done much towards perfecting the methods of anesthesia. Dr. Smith recognizes that dentists have now and again to deal with the introduction of fads into the field of anesthesia. Many new ideas have been introduced and even forced upon the profession before their worth has been fully established. Although this is a tribute to the ability of the salesman who sells the goods, yet it is unfortunate in that it engenders a feeling of distrust towards all innovations. The good suffers with the bad. Numerous forms of apparatus for the administration of anes-



thesia have been sold to dentists, and many have proven failures, either because of faulty construction or because of lack of skill in their manipulation. Whatever the cause the fact is that many have been rudely discarded and are now in evidence only as part of the general junk pile at the back of the laboratory. We ought to encourage the efforts of inventors of dental devices, but at the same time, insist that they be subjected to exacting practical tests by the profession before they are distributed. If such a plan were followed the profession would not, as they do now, hold back when something of real merit is introduced.

Getting back to the subject of anesthesia; let us consider some of the innovations. First, might be mentioned a form of cataphoresis, introduced some time ago. This was a method of producing anesthesia by pressing upon some part of the body remote from the area selected for anesthesia. For instance, pressure upon the toes and fingers was said to produce anesthesia at a distant point. The exponents of this method divided the body into zones, and one of these zones extending from head to foot, could be anesthetized simply by pressure upon a related part. To those who possess knowledge of physiology and anatomy no such scheme would appeal, yet it "caught on" with many.

The next device brought out for the purpose of lessening, or even totally destroying pain, was termed analgesia. "It is a fad with many," says Dr. Smith, "but in the hands of the competent, much good is derived through its scientific employment. Hundreds of gas machines for analgesia are not in use, and are pushed back in the corner covered with dust. It has given me much satisfaction during my travels to inquire of many dentists just why they discarded this method, for in nearly every case they would say that they did not obtain results; and upon questioning them further they would acknowledge they were not in a position to administer the anesthetic." Analgesia (partial anesthesia) is difficult to obtain and maintain unless one is fully experienced in handling nitrous oxide and oxygen, but in competent hands it is an agent of great usefulness. "Nitrous-oxide and oxygen," says Dr. Smith, "is yet without a peer as a general anesthetic; the safest in the hands of the experienced, and the most dangerous in the hands of the novice. Just because hundreds have discarded it, it does not signify by any means that it is worthless, but in the hands of the operator qualified to administer it scientifically it stands supreme among the general anesthetics." A possible reason for the failure of analgesia may lie in the fact that many operators tried to perform operations of a type which demanded deep anesthesia. In this connection Dr. Smith pays tribute to the memory of Drs. Wells and Morton, both of whom did much towards bringing the use of nitrous oxide to its present status of perfection.

Then followed many forms of local anesthesia, many of them



designed to take the place of analgesia. These are meeting with varied success. Dr. Smith expresses the opinion that if properly administered, local anesthesia meets most requirements, but he says, "when an operator does not know the difference between nerve-blocking and terminal, or infiltration methods, or employs hydrant water as a vehicle, something is radically wrong, and it shows that he has sadly neglected his studies along these lines. . . . It is astonishing to see how many take up a subject of this character and subject their innocent patients to experimental procedures; without having practically any knowledge of the underlying factors of this method. It is also astonishing to see how many dentists allow the dental salesman to dictate what they should use and how they should use it. . . . The promiscuous use of any anesthetic is a very poor and dangerous practice and should be stopped. Any agent like an anesthetic—local or general, which produces an abnormal condition is to a certain extent dangerous, and it behooves the anesthetist to be familiar with the physiological action of his agent; yet when he selects the agent with care and administers it with intelligence, the results are highly gratifying.

All dentists are from time to time confronted with the task of performing difficult operations, and at the same time cause as little shock to the patient as possible. In this connection Dr. Smith says, "It has long been known that it is not in all cases the amount of pain really inflicted that causes emotional shock or collapse, but in many cases such results can be attributed to the fear of being hurt. The clinical and laboratory research on shockless operations, accomplished by Dr. Crile of Cleveland, is really a revelation, and his clinical records prove the value of well selected methods."

A point of rare value for dentists has been raised by Dr. Crile regarding the excellent results obtained through the use of local anesthetics, by reason of the fact that no nerve impulses set up by surgical operations reach the brain. Under a general anesthetic, although the patient may not give evidence of pain sensations yet traumatic shock is caused by reason of the different impulses which cause pathological brain changes. "How can we prevent it," Dr. Crile asks, and then he proceeds to answer his own inquiry in part as follows: "On the Kinetic theory, no shock could be produced by traumatizing a territory whose nerve connection with the brain has been broken by nerve blocking. By blocking nerve connections, local anesthetics protect the brain against destructive stimulation of the brain cells. Each anesthetic covers a part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. The patient's fear of the operating room, unsoothing words, and the dread of the operation and the taking of an anesthetic, the rough manipulation of the tissues during the operation, the ungentle post-operative manipulation; all these things generate harmful stimuli,



which are sent to the brain and cause detrimental effects; the stored up energy in the normal brain cell being destroyed." Although such a view may rightly be taken as intended for the general surgeon, yet there is much of value for the dentist as well. If a dentist would create a proper environment before an operation by such means as say, the administration of a preliminary sedative followed by a wise selection and skillful administration of the anesthetic, then the patient would be saved a great deal of discomfort.

The subject of greatest interest for surgeons in recent times, is that of nerve-blocking. As a result of such interest much can now be accomplished through the medium of the local anesthetic that formerly called for the use of a general anesthetic. Indeed, nerve-blocking is preferable in a large number of cases. Take for instance, operations upon the jaws or within the oral cavity. Here the surgeon is greatly handicapped if a general anesthetic has to be administered. Referring to this Dr. Smith says: "The head and neck offer an available field for operation under nerve-blocking. This is especially true of operations involving the face and jaws from the very fact of the constant location and susceptibility of the nerve trunks supplying these parts. The modern trend has been in the direction of blocking the deep nerve trunks and this technic has made possible many major operations which were heretofore performed only under a general anesthetic. It goes without saying that nerve-blocking should only be employed in cases where it is possible to completely block the operated area and render it insensible to pain. Nerve blocking is technical and demands skillful technic in its employment in order to attain satisfactory results for both the operator and patient. Considerable skill is required in making the deep nerve-blocking injections and every one must expect failure at the beginning. The operator should blame failure to the technic used, and should search diligently for the cause of failure to render the parts insensible to pain. The trained anesthetist can make a most valuable use of psycho-therapy in addition to his general anesthetic and this is of exceptional value to the operator employing local anesthesia in its different branches. The imperfection of the technic often leads the operator to persuade his patient, and he himself labors under the delusion that the patient experienced no pain. When the operation is upon a patient who is hysterical and of a nervous temperament, and anticipation and fear of pain are added to the adverse conditions which go to make up the failure, the patient may actually cry out and manifest a high degree of excitement during the operation and afterwards tell the operator that she felt no pain. This type of patient should never be given a local anesthetic but a general anesthetic should be employed, because the dread of the operation and the fear of being hurt is as wearing upon the nervous system as is the actual pain. In every case requiring an anesthetic we should use our best judgment



in deciding which to use; a local or a general anesthetic. The nature of the operation and the physical condition of the patient should both be taken into consideration in the selection. The anesthetist must not be hasty in his decision."

As illustrating the extensive application of nerve blocking we are told that many surgeons are employing it with satisfaction for such operations as, appendicitis, hernia, gastrastomy, tracheotomy, goiter, rib resection, various amputations, varicocele, removal of subcutaneous tumors and other general surgical operations.

Local anesthesia may be divided into first, nerve-blocking anesthesia; second, terminal or peripheral anesthesia. The peripheral method may again be subdivided (Dr. Smith's classification); first, intra-osseous method; second, infiltration method; third, peridental method; fourth, pressure anesthesia. Of these various methods Dr. Smith says: "For the terminal or peripheral method, or any of its subdivisions anesthesia is brought about by inhibiting the function of the terminal or peripheral nerves in a circumscribed area. Nerve-blocking, or in other words, conduction anesthesia, is accomplished by injecting the anesthetizing solution near the nerve tissue at some point between the operative field and the brain: The nerve-blocking method is divided into the extra-oral and the intra-oral; second, into the peri-neural and endo-neural methods. For the peri-neural method of nerve-blocking, the solution is injected into the neighborhood of the nerve trunk supplying the operative field, and the solution reaches the nerve by diffusion, while for the endo-neural method the needle point is inserted into the nerve direct and the solution injected. . . . The smaller, the nerve the more readily an anesthetizing solution will reach the fibres making up the nerve sheath, thus blocking painful impulses. . . . The larger the nerve trunk and the thicker the nerve sheath, the longer the period of time to be allowed for the anesthetizing solution to produce complete anesthesia of that particular nerve trunk."

Success in the use of nerve-blocking methods will be sure to follow, provided the operator has mastered the technic of injection, and also has a thorough knowledge of the anatomy of the parts. Dr. Smith suggests that one of the best methods of getting acquainted with the anatomy is from dissected wet anatomical specimens. He has prepared many of these for his various classes and has them "show all the anatomic land marks in their relationship to each other, which come under the operative field of the oral surgeon, as well as the eye, ear, nose and throat specialist." Again, one must strictly adhere to asepsis. It is true that it is extremely difficult to absolutely sterilize the mucous membrane, but we can nearly meet the requirements in that area into which we propose to insert the needle. Dry the mucous membrane, using sterile gauze held with artery forceps. Then apply a germicidal solution. "I have tried," says Dr. Smith,



"many different solutions for this purpose, but have found none as efficient as equal parts of tincture of iodine and ethyl-alcohol; which give three and a half per cent. solution of iodine and minimizes the chances of causing sloughing or cauterizing of the mucous membrane. Tincture of iodine is one of the most efficient antiseptics and germicides known to modern surgery. When used on a surface containing bacteria it will destroy them and leave the tissue in the best possible condition for repair. The extra addition of alcohol is of value in reducing the standard tincture of iodine as is given in the U. S. P. formula and has some germicidal properties. This solution can be applied very freely covering a surface from two to five centimeters in diameter. It is applied to the surface by a pledget of cotton wrapped around a small wooden applicator, such as is used by the nose and throat specialist. After this technic has been carried out, the area should be protected and great care exercised so as not to permit saliva or any moisture to come in contact with the surface prepared for the reception of the needle."

Mention has been made of the necessity of administering to certain hypersensitive or hysterical patients, some preliminary sedative in order to facilitate the work of nerve-blocking. Dr. Smith suggests the following:—Validol, bromural, bromides and chloral hydrates. "Bromural," he says, "is an efficient nerve sedative and has no apparent action on the circulation or respiration. It is an agreeable hypnotic and sedative and can be administered without any after effects. It is best given in five-grain tablets in warm water, thirty minutes before the operation. Validol is a colorless substance insoluble in water, therefore, it should not be added to water before administering to the patient. A very efficient method for giving this drug is to drop the proper dose, which is seven or eight minims, on a block of sugar. This has been suggested by Dr. C. Edmund Kells, of New Orleans. This preliminary agent should be administered at least thirty minutes before the operation. For those who are desirous of following up this question of nerve-blocking we would suggest a careful reading of Dr. Smith's paper for in it he treats at length with the following problems:—

(1) Mandibular-lingual anesthesia. Blocking the inferior and lingual nerves.—Intra-oral method.

(2) Blocking the second division of the fifth nerve.—Intra-oral method.

(3) Extra-oral blocking for the inferior maxillary or third division of the fifth nerve.

(4) Extra-oral method for blocking the superior maxillary or second division of the fifth nerve.

(5) Extra-oral method for blocking the infra-orbital and anterior superior alveolar nerves.

(6) Nerve blocking anesthesia for tonsillectomy.



These methods are gone into very thoroughly and it would be impossible to even suggest the technic in this brief review. The anesthetizing solution used by Dr. Smith is in most cases Novo-cain-suprarenin—Ringer Solution.

We conclude this hurried review of the subject by quoting the advantages claimed by Dr. Smith for nerve-blocking anesthesia. First, the duration of the anesthesia may be changed according to the various amounts of the vaso-constricting agent. The long duration of anesthesia is of great value to the operator for the removal of impacted third molars, draining the antrum, root amputation, etc.; second, long duration of anesthesia permits the operator to take his time with the operation, which gives him the opportunity to employ all his skill while operating; third, large or small areas may be anesthetized, depending upon the nerve or nerve branches to be blocked; fourth, anesthesia is secured of infected or inflamed areas by blocking the nerve branch in the healthy tissue, at a distant point from the operative field; fifth, nerve-blocking injections, when skillfully made, are without pain because the needle is inserted into the mucous membrane and loose connective tissue; sixth, one or two injections of the needle will block an operative field, depending upon the nature of the operation and the area to be blocked; seventh, co-operation of the patient. It is well known that this is of material advantage to the operator because he can operate with ease and complete the operation with a minimum amount of laceration and without the inspiration of blood and mucus.

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### Important Notice

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THE Dominion Dental Council at its recent meeting, decided that on and after the first day of January next, D.D.C. certificates will not be issued under the provisions of Class C.

#### COPY OF CLASS C REGULATIONS.

All those who on the first day of January, 1905, (or one year previous to the year in which any province enters the D.D.C.), were holders of valid and unforfeited certificates of license in any of the provinces or N.W.T. entering into the agreement, and have been in regular, legal, ethical practice of the profession of dentistry in any of the said provinces or N.W.T. for ten years prior to the date of application, shall upon making application to the Dominion Dental Council present the following evidence in the form required:

- (a) Registration in some province of the N.W.T. of the Dominion of Canada.
- (b) Regular, legal, ethical practice in Canada for ten years prior to the date of application.
- (c) Produce evidence of good moral character. (Candidates under Class C may apply for certificate of qualification at any time).

Licentiates who desire to secure a D.D.C. certificate without examination, under the foregoing provisions, are hereby notified that applications must reach the office of Dr. W. D. Cowan, Secretary-Treasurer, Dominion Dental Council, at Regina, Sask., and the D.D.C. certificate issued in time to enable the recipient to register the same in the province or, provinces desired, on or before the 31st of December, 1918.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**BLEACHING TEETH.**—One of the best bleaching agents for discolored teeth is 25 per cent. pyrozone. The root should be filled, and a pellet of cotton saturated with the pyrozone should be placed in the cavity and sealed with cement. It may be left two or three days, and if a tooth can be bleached at all it will be bleached by this method. The pyrozone comes in sealed tubes. Care must be exercised in opening the tube. It should be chilled on ice and wrapped with a towel, letting the narrow end of the tube extend from the towel. This can then be snipped off with the pliers, and the contents of the tube poured into a clean glass-stoppered bottle. A second application of the pyrozone may be necessary in deeply discolored teeth.—*Editor, Dental Review.*

**FOR THE RELIEF OF PAIN.**—It frequently happens that extreme pain follows the extraction of a tooth or root. Almost immediate relief may be given the patient by inserting a pellet of cotton wet with chloroform to the full depth of the root socket and place your finger firmly over the mouth of the socket for from ten to twenty seconds, then remove the cotton from the socket. Repeat if necessary.—*H. A. Cross, Chicago.*

**TEMPERING SMALL TOOLS.**—Fill the tin top of a catsup bottle with melted beeswax and place conveniently on work bench. When tempering hold instrument—as a chisel, above and near wax; with blow-pipe heat to a dull red, and quickly push instrument into the wax. The degree of hardness depends on how rapidly the instrument is pushed into the cold wax.—*J. T. Search, Qnarga, Ill., Dental Review.*

We are being taught to deposit silver, from ammonia treated silver nitrate, in root canals by using formalin. Since experiments have probably shown that in electric ionization we drive our ions into and not through the root tissue, it occurred to me that this was the best way to deposit the silver in the root tissue, and experiments in practice seem to fully justify this treatment. Use a silver wire electrode.—*F. D. Price.*



To measure the circumference of a tooth for a gold band. Run copper or aluminum wire through the rolls to make a very thin ribbon, or buy the flat aluminum wire used in wireless work and roll thinner and anneal. It can be passed around the tooth and easily slips under the gum margin if desired, and may be punched with the tweezers, as we make orthodontia bands. The correct measure of the circumference of a tooth or root can be obtained in this way quicker than the wire can be adjusted in the dentimeter.—*F. D. Price.*

GERMANY'S NEED OF DENTISTS.—According to the Berne correspondent of the *Morning Post*, "Germany is apparently short of dentists; for she is advertising in the Swiss papers for men or women dentists. The men need be only partially qualified."

TO TEST FOR A LIVING PULP.—For a *cheap* and highly efficient electrical pulp tester, try the following: Generate a static current by sliding the feet (while walking) over a small rug placed near the chair. For anterior teeth, lightly touch them with the tip of the forefinger; for posteriors, use a canal plugger or an explorer. Keep one foot sliding while applying the test.—*R. W. Lee, Chicago, Ill.*

SANDPAPER CHUCK FOR LATHES.—Take any piece of stiff rubber tubing or electric insulation tubing of desired size and length. Place over it your piece of sand or emery cloth. Use a good small elastic band and stretch it over and wind around the chuck as many times as it will allow. Run on the paper chuck and polish away.

INK FOR WRITING ON GLASS.—A good waterproof ink for writing on glass may be made as follows:—White ink: one part Chinese-white (water-color pigment) or barium sulphate is mixed with three or four parts sodium silicate solution (water-glass). The sodium silicate solution should have the consistence of glycerine. Black ink: one part liquid Chinese ink (or Higgin's Eternal Ink, or some similar carbon ink) is mixed with two parts of sodium silicate solution. Either of these inks is applied with an ordinary steel pen. The ink will dry in fifteen minutes and will withstand water. It may be readily removed by scraping with a knife.—*Journ. Amer. Med. Association.*

DANGER IN PRESSURE ANESTHESIA.—The use of cocaine pressure anesthesia, without regard to the presence of infection in the pulp, must be condemned as dangerous empiricism. The forcing of blood contaminated by bacteria and their products into the periapical structures in the endeavor to anesthetize the pulp results in some of the periodontal difficulties which dentists and physicians alike are endeavoring to prevent. The field for cocaine pressure anesthesia is limited, and its misapplication may result in a chronic focus of infection with all its attendant complications.—*Editorial, Pacific Dental Gazette.*



# ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, AUGUST, 1918

No. 8

## EDITORIAL

### Dental Practitioners' Course

A REGISTERED attendance of 8,000 at the recent National Dental Association meeting in Chicago, serves to show a wide-spread appreciation in the dental profession of the absolute need for study, observation, and scientific research, if the exacting demands of modern dental practice are to be honestly and successfully met.

Progressive members of the profession everywhere are clamoring for the organization of study clubs, post-graduate courses and the direction of all the activities of the dental profession along such lines as shall prepare the average dentist to practice his profession more scientifically and enable him to render better service to his patient.

A movement along these practical lines has taken definite form at the Royal College, Toronto, where a course has been instituted in conjunction with the University of Toronto, enabling Dental Licentiates of one or more years' standing to attend a special seven months' course leading to the Degree of Doctor of Dental Surgery. The course is to be known as The Dental Practitioners' Course.

Dental science and practice have made such rapid progress during the past few years that many dentists, to whom modern scientific



dental education was not available in their college days, feel the need of returning to college for a session, for the purpose of familiarizing themselves with modern methods of dental practice. The object of such a course being to meet the particular clinical and scientific needs of each candidate, the curriculum of studies (including laboratories, infirmary, and didactic instruction), is arranged to meet the special requirements of each individual case. The intention is, having regard to the candidate's present knowledge, to plan a course that will enable the dentist to return to his practice and render a better and more scientific service to his patients than was previously possible. It is quite conceivable that in some cases the greater portion of the time would be spent in studying chemical, pathological or physiological problems for instance, while in others more time would be spent upon the more modern methods of dental practice.

No candidate will be admitted unless he is recommended by the official licensing body of the province or country in which he has been in dental practice. In other words, each applicant must be properly authenticated as to character and ethical standing. It is to be noted that for this special course the regular college matriculation standing is not required, and that the course does not lead to a license to practice dentistry. Candidates will be required to write upon the examinations of the senior year, together with such other subjects as may be deemed necessary, having regard to the previous education of the candidate.

All dental study movements should be encouraged. They are worthy of the loyal support of the profession as leading to "Knowledge, Truth and Industry."

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EASY METHOD OF REMOVING REGULATING BANDS.—To remove regulating bands or crowns, grasp the band with forceps and squeeze with firm pressure, repeating the process around the tooth if possible. This will loosen the cement, and may even expand the band so that it can be easily removed.—*F. W. Stephan, Chicago., Dental Review.*

TO REMOVE MERCURY FROM A GOLD INLAY BEFORE BEING SET.—Take a cover from a small tin ointment box, put the inlay in and cover with sulphuric acid. Hold over a flame and let it boil until the inlay looks black, then drop the same into alcohol. This holds good for jewellery also, providing settings are removed before boiling.—*Dental Digest.*

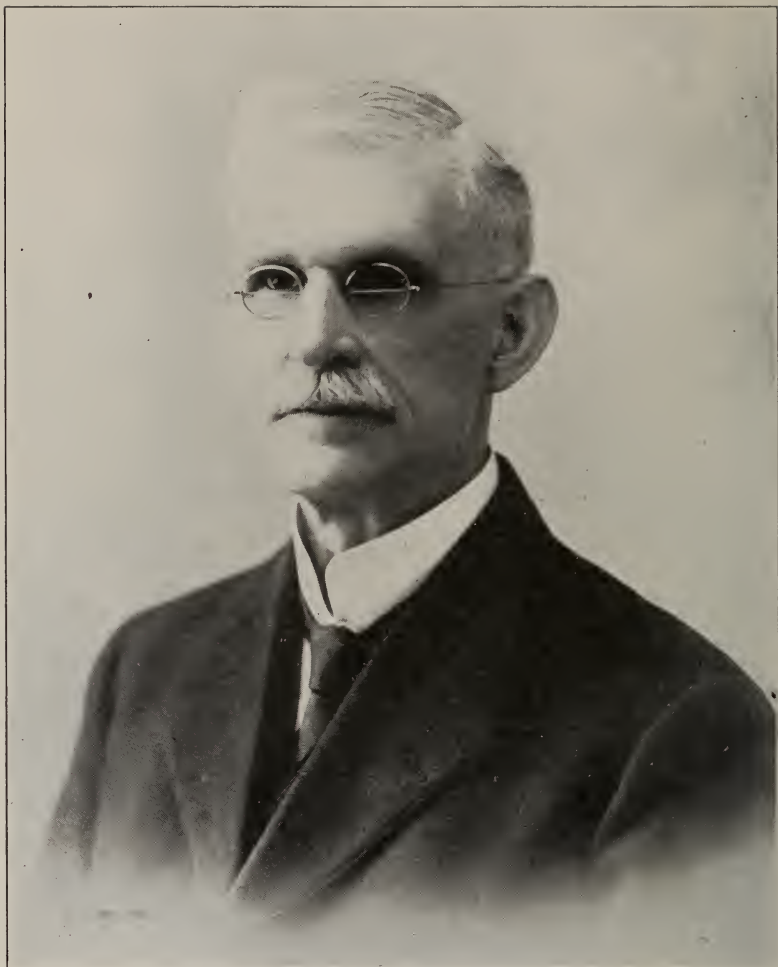


## *Health and Merriment*

*Gold that buys health can never be ill spent,  
Nor hours laid out in harmless merriment.*

*—Westward Ho.*





D R.   F R A N K   W O O D B U R Y.

*Halifax, Nova Scotia.*

*President of the Canadian Dental Association and Dean of the  
Dental Faculty, Dalhousie.*



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, SEPTEMBER, 1918

No. 9

## The Combined Canadian and National Dental Associations Meeting

THE Canadian and National Dental Associations met in convention in the city of Chicago, 5th to 9th August, 1918. The time of meeting was not the most suitable for Canadians, and consequently the C. D. A. registration was not as large as it otherwise would have been. Without doubt the N. D. A. meeting was the largest and most successful convention in the history of the organization. The 1919 meeting of the N. D. A. will be held in the city of New Orleans, while the C. D. A. decided upon Ottawa as the next place of meeting. What the Canadians lacked in number at Chicago they certainly made up in enthusiasm and in sincere appreciation of their American confreres, who had so hospitably invited them to share the many advantages of the N. D. A. meeting. All of the general sessions and the clinics were held in the Auditorium Theatre Building, adjoining the convention headquarters, and the magnificent hall with its tier upon tier of seats and galleries, was usually taxed to its utmost to accommodate those who sought admittance.

The thermometer, however, persisted in hovering around the "one hundred and over" mark, much to the discomfort of the conventioners. Dr. C. N. Johnson, of Chicago, very eloquently welcomed the guests and made everybody, (certainly all the Canadian visitors) feel very much "at home." Dr. Johnson apologized for the hot weather and explained that he had personally arranged for cooler and more acceptable weather, and all had gone well up to the day of the convention, but at that time he had become busily engaged in other matters and had unfortunately completely lost control of the situation, —just as had Hindenburg on the western front.



Colonel Wm. H. G. Logan, as president of the N. D. A., was, of course, the big chief and master of ceremonies. President Logan certainly never lost control of the situation for a single moment and as a presiding and executive officer is certainly unsurpassed. President Nolin, of the C. D. A., responded to the address of welcome and presided at the third general session in the Auditorium Theatre on Thursday evening when Lt.-Col. Guy G. Hume, Captain Villain and Major W. E. Cummer addressed the combined conventions. The two former had been returned from overseas by the Canadian and French Governments for the express purpose of attending the convention and giving an account of the place dentistry is playing "over there" in maintaining the health and comfort of the boys of the Allies.

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*(Note.—The material presented at the Chicago Convention by Lieut.-Col. Guy G. Hume, Captain Villain and Major W. E. Cummer will be published in detail in subsequent issues of Oral Health.—Editor.)*

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## The Chicago Meeting of the C.D.A.

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SYDNEY W. BRADLEY, D.D.S., SECRETARY-TREASURER.

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THIS was the writer's first experience at a really big dental meeting, and it was most interesting from beginning to end. It was impossible to see everything. You were obliged to note what points were especially of interest to you, see them, and not trouble about the others. Over 6,000 dentists registered, and the total attendance was nearly 8,000. Many dentists brought their wives and they were entertained royally by the Chicago ladies. The attendance of Canadian dentists was not so large as it should have been, but was good. Over one hundred were present,—to be exact 109,—fourteen of these being C. A. D. C. officers.

Many Canadian-born dentists, who are distinguished leaders in the profession across the border, were present. Our dear friend Dr. C. N. Johnson showed his love for his native land in his address of welcome, delivered Tuesday evening. Other Canadians whom the writer met were: Drs. Don M. Gallie, D. A. Hare, G. A. Burril and E. H. Thomas, of Chicago; Dr. Elmer Best, of Minneapolis, and many others whose names can not for the moment be recalled.

The exhibits were wonderful: that of a reproduction of Dr. G. V. Black's, Jacksonville, Michigan, office was indeed interesting. To view the life work of this man; his writings, the product of a master mind; his mechanical inventions, the result of a fertile brain and dexterous hands would, indeed, do credit to each of many intellects.



It shows to the average man how few are the talents we possess and how small our ability. On Thursday afternoon a monument was unveiled to his memory in Lincoln Park. At this ceremony Dr. A. W. Thornton, of McGill Dental Faculty, Montreal, gave a masterly oration: a tribute to the life work of this great dentist whose passing has left such a vacancy in the field of dental science.

The business sessions of the C. D. A. were well attended. A new constitution had been framed by a committee appointed at the Montreal meeting in 1916, and this was adopted after some changes. A new committee, which includes the old one and the incoming executive, are to draft by-laws to be presented at our next meeting in 1920. This meeting will be held in Ottawa—the Capital city, and will doubtless be as great a success as the last one held there in 1908.

The finances of our association are in good condition. It is impossible to say exactly, at present, what balance will be carried forward from the present meeting, but it should be in the neighborhood of \$600.

The officers elected were:—

President—Dr. Frank Woodbury, Halifax, N.S.

Vice-President—Dr. H. F. Whittaker, Edmonton, Alberta.

Secretary-Treasurer—Dr. Sydney W. Bradley, Ottawa, Ontario.

Executive—Drs. E. C. Jones, New Westminster, B.C.; Sylvester Moyer, Rose Town, Sask.; H. I. Merkley, Winnipeg, Man.; L. De Guise, Montreal, Que.; F. E. Burden, New Brunswick; J. S. Bagnall, Charlottetown, P.E.I.

On Thursday evening the C. D. A. had charge of the general session. Lieut.-Col. Guy G. Hume gave an address on prosthesis as practised in the Orpington Hospital, England. Dr. Villain, of the Dental Hospital, Paris, told of the work being done in the French hospitals by the dental surgeons. He showed some wonderful contrivances for facial restorations and his clinics were always crowded.

Dr. W. E. Cummer, of Toronto, was unfortunately obliged to abbreviate his talk on Partial Dentures. This was regrettable as many were especially interested in this work. Dr. Cummer's clinics were crowded from the moment the models were shown, and I believe Dr. Cummer is at present the best known Canadian dentist in America.

Those present at the meeting were the following:—

Adams, J. Frank, Toronto, Ont.  
Abbott, Harry R., London, Ont.  
Allen, A. H., Paisley, Ont.  
Bruce, E. E., Kincardine, Ont.  
Bradley, S. W., Ottawa, Ont.  
Bradley, Major F. H., Sherbrooke, Que.  
Black, H. W., Sydney, N. S.  
Bagnall, J. S., Charlottetown, P.E.I.  
Biehn, C. E., Chesley, Ont.  
Bannerman, H., Owen Sound, Ont.  
Bowles, M., Winnipeg, Man.  
Rush, G. F., Winnipeg, Man.  
Box, H. K., Toronto, Ont.  
Bothwell, J. A., Toronto, Ont.  
Bewell, H. E., Dauphin, Man.

Brown, Capt. J. B., Charlottetown, P. E. I.  
Cosgrove, R. H., Ottawa, Ont.  
Campbell, T. F., Galt, Ont.  
Courtice, A. J., Winnipeg, Man.  
Cowan, Major W. D., Regina, Sask.  
Craig, J. J., Bowmanville, Ont.  
Charrow, Ernest, Montreal, Que.  
Conboy, F. J., Toronto, Ont.  
Chalmers, W. L., Alexandria, Ont.  
Canning, Capt. D. W., Hamilton, Ont.  
Cummer, W. E., Toronto, Ont.  
Clayton, Lt.-Col. W. B., Ottawa, Ont.  
Delorme, A. D., Montreal, Que.  
Dixon, J. M., Medicine Hat, Alberta.



- Dubeau, E., Montreal, Que.  
 Dalzell, W., Portage la Prairie, Man.  
 DeGuise, L., Montreal, Que.  
 Emerson, Capt. R. W., Toronto, Ont.  
 Fisk, G. V., Toronto, Ont.  
 Gray, J. H., Hamilton, Ont.  
 Green, Major W. R., Ottawa, Ont.  
 Giles, W. J., Montreal, Que.  
 Grieve, Geo. W., Toronto, Ont.  
 Garvin, M. H., Winnipeg, Man.  
 Holmes, H. A., Toronto, Ont.  
 Halperin, Lt. H. M., Valcartier, Que.  
 Hume, Lt.-Col. Guy, Toronto, Ont.  
 Irvine, H., Lindsay, Ont.  
 Jeffs, W. T., Dresden, Ont.  
 Jones, E. C., New Westminster, B.C.  
 Julien, Hector, Montreal, Que.  
 Johnston, J. E., Hamilton, Ont.  
 Joncas, J. S. L., Winnipeg, Man.  
 Jones, J. M., Vancouver, B.C.  
 Jeffrey, C. C., Winnipeg, Man.  
 Jones, R. C., Melita, Man.  
 Jeffrey, H. C., Winnipeg, Man.  
 Katz, M., Toronto, Ont.  
 Locheed, J. A., Hamilton, Ont.  
 Leckie, D. G., Winnipeg, Man.  
 Lapointe, E., Montreal, Que.  
 Larseneur, T. L., Montreal, Que.  
 Marshall, O. A., Belleville, Ont.  
 Martin, Oliver, Ottawa, Ont.  
 Merkle, H. I., Winnipeg, Man.  
 Madill, Capt. W. S., Toronto, Ont.  
 Mills, G. K., Tilbury, Ont.  
 Magee, Major Jas. M., St. John, N.B.  
 McGregor, J. R., Elora, Ont.  
 McDougall, J. S., Winnipeg, Man.  
 McDonagh, A. J., Toronto, Ont.  
 McComb, C. S., Port Arthur, Ont.  
 McKim, H. A., Toronto, Ont.  
 Nolin, Jos., Montreal, Que.  
 Olivier, V. H., Sherbrooke, Que.  
 Paul, E. W., Toronto, Ont.  
 Pipus, W. A., Calgary, Alberta.  
 Parson, J. M., Winnipeg, Man.  
 Powers, C. A., Brandon, Man.  
 Robb, H. G., Calgary, Alberta.  
 Rhind, J. E., Toronto, Ont.  
 Ryan, F., Toronto, Ont.  
 Ross, Capt. H., Regina, Sask.  
 Rouleston, G. F., Exeter, Ont.  
 Ramore, W. D., Port Arthur, Ont.  
 Risinger, H. R., Winnipeg, Man.  
 Riggs, R. M., Claresholm, Alberta.  
 Robertson, H. A., Hamilton, Ont.  
 Ritner, S. B., Gravelbourg, Sask.  
 Slade, J. A., Toronto, Ont.  
 Simpson, J. F., Trenton, Ont.  
 Snell, C. A., Toronto, Ont.  
 Simpson, C. N., Port Arthur, Ont.  
 Seccombe, W., Toronto, Ont.  
 Shantz, U. B., Kitchener, Ont.  
 Spaulding, W. G. L., Toronto, Ont.  
 Snipes, B. W., Vancouver, B.C.  
 Smith, W. C., Toronto, Ont.  
 Stewart, J. M., Hamilton, Ont.  
 Switzer, F. K., Saskatoon, Sask.  
 Sangster, F. N., Sarnia, Ont.  
 Thomson, Capt. H. S., Toronto, Ont.  
 Thornton, A. W., Montreal, Que.  
 Thomson, Major G. K., Halifax, N.S.  
 Thompson, Lt.-Col., W. G., Hamilton, Ont.  
 Wright, Leslie, Calgary, Alberta.  
 Woodbury, Frank, Halifax, N.S.  
 Webster, A. E., Toronto, Ont.  
 Willmott, W. E., Toronto, Ont.  
 Whittaker, H. F., Edmonton, Alberta.  
 Wilkinson, H. G., St. Mary's, Ont.  
 Walker, Geo. C. J., Dauphin, Man.  
 Weagant, C. H., Winnipeg, Man.

## The Black Historical Exhibit

C. ALVIN SNELL, D.D.S.

IT is safe to state that one of the most interesting features of the meeting of the National Dental Association in Chicago, was that known as the Black Historical Exhibit. It was at once the despair and the inspiration of the many who saw it. As one considered one's own littleness of achievement, the revelation of the many diversified activities of one, who, perhaps, more than any other, exalted and adorned the profession of his choice, was a cause of deep humility. But to the younger men, especially, the record of Dr. G. V. Black's life ought to be a wonderful inspiration, and to those who had not the privilege of seeing this exhibit, a brief description should be of interest. The exhibit shown covered the period of Dr. Black's life from the time of his entry into the practice of dentistry in 1858, until his death in Chicago in 1915. From 1885 to 1897, his office at Jacksonville, Illinois, adjoined his residence. A replica of this office was shown, the furnishings for the most part, being the identical articles used by Dr. Black. Replicas had been made of a few things which were lost or destroyed.



As we linger in these rooms, which seem to breathe forth a spirit of tireless energy, we first see Dr. Black as an artist, for on the walls hang sketches by this versatile man. One's attention is also drawn to some oil paintings by Mrs. Black, to whom by reason of her devotion and self-sacrifice, it is said by those who knew her, much of the credit for Dr. Black's achievements is due.

We witness his mechanical ability as we look at the many articles of furniture and equipment made by himself, including his dental engine, he being the inventor of one of the first cord-driven, foot-power dental engines in 1870, bracket table, crown and bridge bench, and many scientific instruments. An entire show case was filled with these instruments, which he made in his own machine shop adjoining his office.

We know him as a musician of ability. Three of his own instruments were displayed, his violin, cello, and piccolo. He also played the piano, flute and cornet.

His contributions to dental literature are well known, but the extent of our indebtedness to him is better appreciated when we are told that it would take fifteen magazine pages to print the titles alone. Hundreds of original manuscripts were shown, and one can readily believe that it would take several years of a stenographer's time to copy all that Dr. Black wrote. A scrutiny of the titles shows, too, that he was a student in many fields, apart from dentistry. There were articles on the Solitary Wasps, the Seventeen-Year Locusts, the Earth Worm, Tornadoes, Fossil Woods, Our Police System, the Use of Books, Typhoid Fever, Scarlet Fever, Bright's Disease, Mechanic Arts, Morality, the Microscope and its Uses, the Theory of Sight, City Water Works, several Indian stories, many articles on chemical subjects, articles on travel, etc., etc. We are informed that for fifty years it was part of his routine to make written records of his thought and work, and thus he left a rich legacy.

We were reminded, too, that for a brief period he was a soldier, for he, too, lived in stirring times. He enlisted in the 129th Illinois volunteers in 1862, and was discharged for disability in 1863.

It is intensely interesting and instructive to learn that this busy man could play as successfully as he worked, and there is surely a lesson here for many a dentist. It was his habit to spend from four to six weeks every summer in the woods. One of his literary contributions is entitled: "How to Rest." His fishing tackle was shown, and also photographs of himself, while on his vacation trips. These he took himself by means of a mechanical device he constructed, which enabled him to step in front of the camera after making his adjustments.

Two show cases were filled with costly gifts which he had received at various times as tokens of appreciation of his life and work; and many diplomas conveyed to the mind something of the esteem in which he was held, and of the honor which was conferred upon him,



by his professional brethren. Considerable interest was shown in a printed and framed card, which hung on the wall of Dr. Black's operating room, containing a statement of the fees of the dentists of Jacksonville. When we remember that this was in the year 1860, and compare this list with the average dental fee to-day, we may well wonder as to what has happened in the meantime:

#### PRICE LISTS OF THE DENTISTS OF JACKSONVILLE.

##### *Operative Dentistry.*

|                                                             |                 |
|-------------------------------------------------------------|-----------------|
| Filling with gold, smallest crown cavity. .                 | \$ 3.00         |
| Large and more difficult cavities . . . . .                 | \$4.00 to 10.00 |
| Nerve cases and those requiring treatment<br>from . . . . . | 5.00 to 20.00   |
| Filling with other material than gold . . .                 | 1.50 to 5.00    |
| Extracting teeth . . . . .                                  | 1.00            |

##### *Mechanical Dentistry.*

|                                             |                   |
|---------------------------------------------|-------------------|
| Single tooth . . . . .                      | \$8.00 to \$10.00 |
| For additional teeth—each . . . . .         | 4.00              |
| Full upper and lower sets, on rubber . . .  | 65.00             |
| Full upper or lower set on rubber . . . . . | 35.00             |

As we think of the vast amount of work this wonderful man was able to do, this question at once suggests itself: Why was Dr. Black able to accomplish so much? The answer will probably be found in a marvellous capacity for sustained effort. And even while we acknowledge our debt of gratitude to him, we are glad also to learn that those who knew him best, loved and admired him; not because of his mechanical ability, nor his university lectures; not because of his literary activities, nor his contributions to science; not because of what he did, but because of what he was. With characteristic forcefulness Dr. C. N. Johnson once said: "To know him was to love him."

We are grateful to those who prepared this exhibit. Thus, we who did not know him, can at least learn something concerning him, and be inspired by his full and noble life.

## Amendments to the Constitution of the Dominion Dental Council

EMORY JONES, D.D.S., REPRESENTATIVE OF BRITISH COLUMBIA,  
ON THE DOMINION DENTAL COUNCIL.

AT the bi-annual meeting of the Dominion Dental Council, held in conjunction with the Canadian Dental Association, at Chicago, several amendments to the Constitution were made:

1. The dentists registered in British Columbia when that province



became an agreeing province, were granted the same privileges of obtaining a Class C certificate, that those of the other provinces were given when they entered.

2. After January 1st, 1919, no Class C certificates will be issued.

3. All those who are holders of valid and unforfeited certificates in any of the provinces entering into the agreement, registered in some province, and have been in regular, legal, ethical practice in Canada for at least five years prior to the date of application for examination, and who produce evidence of good moral character, shall have the opportunity of trying the modified examination known as Class D, regardless of whether the candidate be Canadian or foreign graduate.

For some time the Council has heard objections from several provinces to the granting of Class C certificates because under this class no examination was made of the candidate's standing. By the amendment to the constitution no D.D.C. certificate of qualification shall be granted without examination, after the present year.

The Council fully realizes that the D.D.C. was formed by Canadians for the benefit of Canadian institutions and also for the benefit of Canadian citizens. But, it felt that the constitution unduly discriminates against American and other foreign graduates. In the Western and Maritime Provinces the most of the dentists are American graduates, and many of these were born and lived in Canada except when taking their dental college training. The Council felt that these men should be granted a D.D.C. certificate providing they showed their efficiency by passing the examination and had been in ethical practice in Canada for five years previous to application.

The members of the Council firmly believe that the above amendments to the constitution will so raise the standard of the D.D.C. certificate that it will finally be recognized as a standard by all the British possessions and the United States of America.

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## A Few Impressions of the Clinics at the N.D.A.

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W. G. L. SPAULDING, D.D.S.

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THE clinics were given under classified sections which helped one to choose the direction of his interest. Promptness and enthusiasm were marked features.

In keeping with the prominence and attention given to root canal technique and its relations, a number of clinics on treatment, sterilization, filling and silver reduction met with marked appreciation. It is desirable to find an agent as effective as silver nitrate which will produce no undesirable discoloration of dentin. Gold chloride was shown experimentally, coloring the dentin of the root a deep red with much less penetration of the tubuli than with silver nitrate. Its efficiency is yet to be determined. A variety of reducing agents are



being tried out in an effort to avoid the use of formalin in root canals.  $H_2O_2$  and creosote, both being effective but slower. There are many others and further experience may produce a widely acceptable one. Proved suggestions would be interesting.

Clean operating habits and maximum sterilization were demonstrated, no new departure being presented. Super-heated steam, dry and moist heat, alcohol, lysol, formaldehyde chamber all being used. The method commending itself to the writer as being most thorough follows, using root canal operation as illustration. Materials, drugs and instruments to be used are assembled in order on the tray of a cabinet sterilizer and kept on it in the formaldehyde gas until wanted. When brought out for use, everything on it which the fingers could touch,—bottles, cotton canal points, gutta percha points, will be sterile. This is not unimportant. With rubber dam applied the teeth are swabbed with iodin solution. Cotton is never wound on broaches, bibulous paper points being used in the canals instead. Cotton pellets ready made and heat-sterilized, are the only ones used. This seems the only practical way of attempting asepsis in root canal work. The surroundings of the operation deserve attention. Receive no visitors or friends in the operating room, keep the air moist, screen all window apertures with cheese cloth readily renewable on light frames,—these precautions will contribute toward success with that root canal. The assistant must be as conscientious as the operator in the effort to maintain this standard.

A method of meeting some of the objection to fixed bridgework, consisted of rigid anchorage to one abutment, while the other end was supported on a crown or inlay by a dowel laid in a horizontal mortise. Individual socket movement of the supporting teeth is not hampered, allowing the periodontal membrane exercise without injury. The case was restoration of two upper bicuspid supported on first molar and cuspid.

An M. O. D. gold inlay was made in a 22k-35 gauge gold band soldered and fitted. Wax and band removed together, cast and trimmed. In this method distortion is avoided, contacts made at correct points, and the finishing of wax on approximal surfaces rendered unnecessary.

#### CAVITY PREPARATION FOR SILICATE FILLINGS.

Three main points to guide the technique of cavity preparation are:

1. Location of enamel margin to be made in accordance with the physical properties of the material used.
2. Cavity walls and enamel angle should be made as nearly at right angle to pulpal wall and tooth surface as the conformation of the tooth will permit.
3. Filling material must be adapted and held under pressure.

An ingenious way of securing anchorage by crown to diverging upper molar roots, consisted of a coping with two posts in the buccal





Dr. Donald M. Gallie

Chairman of the General Clinic Committee, National Dental Association Convention

*IT would appear to the Editor to be almost unnecessary to place a name under the accompanying photograph so well known is Dr. Gallie, both in Canada and the United States. When you meet Dr. Gallie just call him "Don." It won't make a particle of difference to him whether you were formally introduced or not, so long as you are a dentist. Just say, "Hello Don—Glad to see you!" and then watch him smile—you will be repaid.*

roots and a crown fitted over coping with a post passing through a hole in coping into palatal root.

The development of Palladium alloys of gold was shown to have produced metal with good color, elasticity, and high fusing point. The cost is about half that of platinum.

Timely and much appreciated demonstration of interpreting radiographic pictures with prognosis, dealt with those fine decisions often vexing and puzzling the average practitioner.

A gold inlay technique using a matrix in approximal cavity with hard wax, emphasized the importance of having wax rather stiff, with a flashed surface, under sustained pressure. Chilling or reheating of wax is to be avoided. Keep at room temperature, and mix investment with luke warm water. Heat investment slowly, avoid bubbling of wax, and when investment has absorbed melted wax, go fast to burn out the wax.

A treatment of enamel for which much merit is claimed, consists of painting the enamel and even the gum margins, with 20 per cent. silver nitrate and in a few moments following with iodine solution. Two repetitions at two-day intervals producing astonishing hardness and density of the enamel. Resistance to caries is greatly raised. There is no discoloration of the enamel where it is unbroken, but the claim is made that irritation of the pulp by osmosis of toxic material is prevented.

Technique of nerve-blocking for a real anesthesia was splendidly demonstrated on the wet specimen. Success with this method will depend on a well developed technique, proper needle, trained observation and maximum sterilization.

At St. Joseph's Hospital Dr. Truman Brophy operated two cases, one two years old with double hare lip in which the pre-maxilla had



been wired into the arch three weeks before,—the other nineteen years old, in which some years ago the pre-maxilla had been removed. The necessity of teaching that the pre-maxilla must never be removed was by these two cases amply demonstrated. The child was restored beautifully. The adult will require a bridge prosthesis of the incisor portion of the arch providing for the attachment of an obturator. The operation gave him a splendid nose and lip. A remnant of mucous membrane along the old scar was removed, the spreading alae drawn in, the columna cut free and sutured half an inch higher to the nasal septum, thus removing the flatness and forming a very graceful point. The short, flat, upper lip was lengthened into a pleasing bow by a flap from either side turned down and sutured together, the loose-hung cheek tissue, always present in such cases, furnishing the necessary bulk of tissue when drawn mesially by sutures. Horse hair sutures were used and the skin slightly everted at the edges of the wound to prevent the formation of a grooved cicatrix.

Surgical restorations of the face are in a field which a dental surgeon could very rightly consider open to him.

Grouping of clinics and avoiding chair clinics were two commendable things and the good spirit, high professional ideals, fraternity and desire to impart useful knowledge, gave valuable teaching in a delightful way.

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## Dedication Oration, Greene Vardiman Black Memorial

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DELIVERED BY A. W. THORNTON, D.D.S., DEPARTMENT OF DENTISTRY, MCGILL UNIVERSITY, MONTREAL.

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IT would be the veriest hypocrisy for any man to pretend that he did not look upon such a privilege as is mine to-day, as a very great honor, and it would be an insult to your intelligence to expect you to believe that such an occasion is one of the ordinary events of any man's life.

I appreciate the honor and feel the responsibility more deeply, perhaps, than any of you can imagine.

Any ordinary man might, perhaps, have some knowledge of the application of colors to a canvas, might possess some ability in free-hand drawing, might understand the underlying principles of perspective, but such knowledge or such ability would not justify a person in attempting to paint a landscape or a portrait to hang in an Art Gallery with the world's masterpieces.

And so, it appears to me, the occasion that brings us together at this moment, demands the effort of a "workman that needeth not to be ashamed" to worthily deal with the subject which has been assigned me. Let me say to you in absolute frankness and in perfect



honesty, that I feel totally incapable of measuring up to what you have a right to expect. But when your President asked me to undertake this duty, there was but one thing to do—accept.

And, if I fail adequately to express the love which we all felt for the man to whose life and labors this memorial is dedicated, let your own full hearts at this moment, be the measure of that appreciation, which my poor words must fall short of expressing.

As I tried during the past weeks, to think of the exercises in which we were to take part to-day, there came to my mind again and again, the words of King David, spoken three thousand years ago of Abner, "A prince and a great man is fallen." The term "a great man," is frequently heard, and yet, to what a comparatively few men, can the words be fitly applied.

In law, Moses stands preeminent, for the simple reason that the moral law, the Ten Commandments, stands to-day as it stood three thousand five hundred years ago, the very foundation principle of national as well as of individual greatness.

In sociology, the world has seen but one perfect example—The Man of Nazareth. In a few sentences, he laid on bed rock, the basic principles of ethical relationships between man and man, and between nation and nation, and the violation of these principles by a powerful European nation, is the cause of the terrific struggle now convulsing the world. Let me quote just a sentence or two, embodying some of His foundation principles:

"Whatsoever ye would that men should do to you, do ye even so unto them likewise." "I came not to be ministered unto, but to minister." "Let him that would come after me, deny himself." "He that loseth his life shall find it, shall keep it unto life eternal."

Read to-day the biography of the world's great men and you will find a striking similarity in life and thought and purpose in all of them. What man or woman can possibly attain to greatness and persistently violate any one of the Ten Commandments? Would you call any man great who would attempt to deal with his fellowman as he would not wish a fellowman to deal with him? Could a man by any stretch of imagination, be called great, who was always receiving the ministrations of others in selfish enjoyment? What man to-day has the greatest chance of being classed with the world's great men? Is it not the man who has learned most perfectly, the lesson of self-denial?

In the world's great cataclysm at the present time, who are the men whose names and whose memories are being enshrined in the hearts of all right thinking persons? Are they not the men who are losing their lives in order that national and individual lives may find a chance to express themselves along God-given lines? And was it not along the lines that I have just indicated that the life of the man whose memory we have met to honor, found expression?



Think of the work accomplished in a single life time. It was fundamental in character, it was stupendous in volume. When his own operations, as well as the operations of other men failed, he sought the reason of the failure and the means by which failure might be avoided, and he gave to the profession, scientific methods of operation which shall bless humanity while time lasts.

There is a question that must be ringing in the mind of every man here present. It is this: Why is it that men such as Dr. Black are able to accomplish so much, while most of us do so little? Is the difference between such men and the rest of us simply one of mental endowment? Are these men mental giants and the rest of us mental pigmies? No. I think not. What then is the reason? Is this the explanation? Only a few men in each generation are capable of sustained effort and this, perhaps, is the secret of all true greatness. Longfellow has expressed that thought in these words:

“We have not wings, we cannot soar,  
But we have feet to scale and climb  
By slow degrees, by more and more  
The cloudy summits of our time.”

“The mighty pyramids of stone  
That wedge-like cleave the desert airs,  
When nearer seen and better known,  
Are but gigantic flights of stairs.”

And is this not the secret of the unparalleled success of him whose memory and whose life work we delight to honor? Do you know that it takes fifteen pages of ordinary magazine size, in very small type, simply to give the titles of Dr. Black's contributions to the profession, of which he was the most distinguished member. The desire to attain to his own full stature must have taken possession of him even in early life.

Some years ago, I attended with Dr. Black, and a number of other men from Chicago, the fiftieth anniversary of the St. Louis Dental Association. At that meeting, Dr. Black showed some lantern slides of sections of teeth that he had made years before, by hand with a pen and India ink, before such slides were made by photography, and they were as accurate and almost as delicate as those made by the scientific apparatus now available.

But the books which he wrote, the contributions which he made to so wide a field in science, the teaching he did in a great university, these are not the things that call out to-day, this voluntary expression of gratitude and esteem. We admire the ability which enabled him to overcome, where smaller men must have met with failure. We acknowledge the debt we owe, because we are able to accom-



plish things which would have been altogether impossible had he not blazed the pathway to success.

We feel keenly, our own lack of attainment, when we think of him "in labors more abundant," but, we loved him—not for what he did, but for what he was.

Many of the men taking part in this exercise to-day, have a mental picture of him as they knew him best. Some will think of him as they met him at professional gatherings and the outstretched hand, the genial smile, the kindly word, seem to forge again the link that was broken, and they wonder if it can be indeed true that the "Silken cord has been loosed." Others, especially the members of Faculties from other schools, will have a vision of him in his own school, as the hearty, unassuming welcome was extended. Others, perhaps, by far the largest number, will think of him as he walked through the Infirmary, dropping a hand on a shoulder here, offering a word of advice there, giving a little help with an operation some other place, and as he did so, many a difficult operation became easier, many a problem was more readily solved, many a downhearted student felt that a veritable benediction had come "by the laying on of hands."

But why, may I ask, are we to-day, dedicating and unveiling a memorial to Dr. Black? Why in all ages and in every country, have monuments been raised to great and good men?

"Can storied urn or animated bust,  
Back to its mansion call the fleeting breath?  
Can honor's voice provoke the silent dust?  
Or flattery soothe the dull cold ear of death?"

We all know that this can mean nothing to him, who so short a time ago joined the great company of those whom "we have loved long since and lost a while." Why then do we do these things?

Two reasons, perhaps, actuate us: The first, to show to the world and to his immediate dear ones, that we loved the man, and appreciate the life work fraught with such momentous importance to all future generations; and in the second place, to inspire others to lead lives devoted, as his was, to the amelioration of suffering and to the extension of scientific education and individual culture, the only foundation upon which it is possible to rear the superstructure of national and individual greatness, happiness and prosperity.

More than three thousand years ago, that greatest of all questions was asked: "If a man die, shall he live again?" It has never been answered as we would answer or prove a proposition in Euclid so that we might write after the answer, "Which was required to be demonstrated."

But strange indeed, would be our conception of creation or evolution, whichever you wish, if having ears, there were no songs of birds



or laughter of children, no strains of sweet music nor articulate sounds of loving voices. It would be strange, would it not, if having eyes to see, there were no rosy morns or glowing sunsets, no green valleys nor snow-capped mountains, no mountain torrent flashing its myriad of crystals in the sun or placid lake reflecting back the softened rays of a harvest moon, "no sky and flowers and trees."

So, I believe that in some way, the greatest yearning of the human soul, its capability for love and service and companionship will be satisfied "when the golden bowl is broken, when the pitcher is broken at the fountain, when the wheel is broken at the cistern and the Spirit returns unto God who gave it."

To have known a man like Dr. Black, to have enjoyed his friendship, to have felt the warmth of his social nature, to have feasted mentally so often and so bounteously on the satisfying mental pabulum of his production, is to intensify and make more real the belief that "when the earthly house of this tabernacle is dissolved, we have a building of God, an house not made with hands, eternal in the Heavens."

In the Genesis account of creation, it is said that God created man in His own image and likeness. It is in the lives of such men as Greene Vardiman Black, that the eternal, the infinite, the loving nature of God is most clearly discernible. In the early ages, the passing of such men was spoken of in some such words as these: "Having served his day and generation, he has fallen on sleep."

Could words be truer of any man than of Dr. Black. Having served his day and generation, full of years and of honor, loved most by those who knew him best. "He has fallen on sleep." May "a double portion of his spirit" fill all our hearts.

Perhaps Dr. Black's philosophy of life, life here, life hereafter, might be summed up in the following words:

"For me to have made one Soul,  
The better for my birth:  
To have added but one flower  
To the garden of the earth.

"To have struck one blow for truth,  
In the daily fight with lies:  
To have done one deed of right  
In the face of calumnies.

"To have sown in the souls of men  
One thought that will not die,  
To have been a link in the chain of life,  
"Twill be Immortality."



# Dental Research Committee of Canada

## REPORT OF RESEARCH COMMITTEE, CANADIAN DENTAL ASSOCIATION, 1918.

OWING to disturbed conditions in the Canadian Dental colleges and throughout the profession due to the war, your Committee is not able to report as great progress as it would wish.

At the last meeting of the Canadian Dental Association, held in Montreal, in 1916, the following were appointed Research Committee for the Canadian Dental Association:—

Prince Edward Island—Dr. J. S. Bagnall.

New Brunswick—Dr. Hagerman.

Nova Scotia—Dr. Frank Woodbury.

Quebec—Dr. Louis Jack.

Ontario—Research Committee appointed by the Board of Directors, R.C.D.S.

Manitoba—Dr. Garvin.

Saskatchewan—Dr. S. Moyer.

Alberta—Dr. Verrinder.

The Executive of the C.D.A. decided that the Ontario Research Committee should act as Executive of the Canadian Committee.

Your Committee has kept in mind the importance of linking up, so far as possible, clinical observations by practising dentists with scientific laboratory tests.

The Committee sent out a questionnaire upon the question of "Eruption of Teeth," to some sixty dentists, who, it was thought, would be specially interested.

### CLINICAL RECORD OF DATE OF ERUPTION OF TEETH.

A "date of eruption" chart was prepared with two sections: one for the deciduous teeth, and the other for the secondary teeth, with two columns in each section. The first column to record the exact age at the first appearance of the tooth, and the second, the age at full eruption. Also spaces were made available for notation of family dental history, and the probable cause of premature or retarded eruption.

The Committee is not yet in a position to report on the result of this questionnaire, but the interest of dentists has been shown by a request for further charts.

Regarding laboratory research, your Committee would urge that an effort be made to assign to every dental college in Canada a specific problem to be worked at in their own laboratories.

### REPORTS OF DENTAL COLLEGES.

Dalhousie reports interesting research work by Dr. Ritchie and his colleague, Dr. F. W. Ryan, consisting of Root Canal Preparation, Treatment and Filling. The various methods in use were submitted



to a rigid microscopical examination, the results tabulated and conclusions drawn.

Also, a critical study of the organic contents of the dentine, its relation to focal infection and a method of preventing the same through fixation of the tissues by means of histological technique and an agent suggested by Dr. Ritchie, not hitherto used. The report will be published later.

At the Royal College of Dental Surgeons, Dr. Harold Box reported to the Committee as follows:—

“Time was given to the problem of the histo-pathology of Alveolar Abscess. While this work, as a whole, is unfinished, yet we have been able to complete some phases of the problem, particularly that relating to Granuloma and Cysts.

“Important work has also been undertaken in connection with the co-relation of some of the common clinical gingival pictures, with the histo-pathology of the cases in hand, special reference being given to the cause and treatment.”

Professor Lancaster, of the Department of Chemistry, R.C.D.S., was asked to supervise the expenditure of a grant of \$100.00 upon investigations made in the college laboratory and at the laboratories of the Provincial Board of Health. The subject selected for investigation was “The Presence or Absence of Free Sugar in the Saliva Under Various Conditions.” Professor Lancaster reports as follows:

“This research is well under way. We have made progress sufficient to lead us to hope for a valuable report. Details will be ready in the course of a few months.”

Reports from other dental colleges were not received in time for this report.

The Board of Directors of the R.C.D.S. made a grant last year to the work of this Committee and has now made a further grant of \$100.00 to the Research Committee for the coming year.

#### PLAN OF ORGANIZATION.

Your Committee begs to recommend the following plan of organization for Dental Research in Canada:—

##### *Name.*

There shall be appointed a Committee, to be known as the Dental Research Committee of Canada (D.R.C.C.),

##### *Members of Committee.*

(a) There shall be a Research Committee in each Province, appointed by the Provincial Board, and composed of three members, or more, representing the several dental organizations of the Province.

Each Provincial Committee shall carry on Research organization and work, in their respective province, under the direction of the Executive of the D.R.C.C.

(b) The chairman and one other member of each Provincial Research Committee shall be members of the D.R.C.C.



*Meetings of Committee.*

The D.R.C.C. shall meet at the time of each meeting of the Canadian Dental Association.

*Members of Executive.*

At each meeting of the D.R.C.C. a president, secretary and treasurer, shall be appointed, and these officers, along with the president of the C.D.A. and chairman of the Finance Committee, and the members of one of the Provincial Committees, to be named by the D.R.C.C., shall form the executive of the D.R.C.C. for the ensuing term.

*Objects.*

1. To carry on among the Dental Associations and Dental Colleges of Canada an intensive study of the perplexing problems which confront our profession, and to investigate, scientifically, current methods in dental practice. Where possible, the work to be done under the direction of the head of the Department by a recent graduate, who, during his college course, has shown special ability in this line of work.

2. To give assistance, through the laboratories, library, and other facilities at the College, to members of the profession in their efforts to find satisfactory solutions for the difficult problems which they meet in practice.

3. To give financial, or other assistance, to some worthy member of the profession, who is struggling with some great problem, and making sacrifices far beyond his means.

4. In short, to serve humanity, and the dental profession by investigation, study and research in connection with oral defects and disorders and their consequent systemic lesions, and all other matters pertaining to the science and practice of dentistry.

*Finances.*

1. Each Provincial Association will be expected to collect, as part of their annual fee, an extra dollar, to be sent to the treasurer of the D.R.C.C.

2. Every other Dental Society and Board in the Dominion will be requested to make a grant to the D.R.C.C.

3. Individual members of the profession will be invited to become sustaining members by giving a liberal contribution or a fixed amount each year.

4. The members of the profession will be expected to inform and educate their patients in regard to the benefits humanity will derive from this important work, and thus encourage them to give financial assistance.

5. When the Committee makes a grant to any college in connection with any special study to be undertaken at the said College, the governing board of the college will be expected to render the undertaking generous financial assistance.



6. As the work progresses, an effort will be made to raise an endowment.

R. Gordon McLean (Chairman).  
Harold Clark.  
Fred J. Conboy.  
A. E. Webster.  
H. M. Lancaster.  
W. E. Cummer.  
A. D. A. Mason.  
Harold Box.  
G. R. Anderson.  
Wallace Seccombe (Secretary).

The report of the Research Committee was unanimously adopted by the Canadian Dental Association and the appointment of one of the Provincial Committees to act as the Executive of the D.R.C.C., was left to the new C.D.A. executive.

The C.D.A. executive subsequently met and appointed the Ontario Committee to act as the executive of the D.R.C.C. for the ensuing term.

### A Correction—Class C., Dominion Dental Council

ORAL HEALTH has received the following letter from Dr. W. D. Cowan, Secretary-Treasurer, Dominion Dental Council, drawing attention to a slight error that crept into an announcement concerning the Dominion Dental Council, that appeared in the last issue. Dr. Cowan's letter is as follows, and is self-explanatory:—

Regina, Sask., Aug. 26th, 1918.

Dr. Wallace Seccombe,  
Toronto, Ontario.

Dear Dr.:—

I have just been shown a copy of Oral Health, containing your reference to the Class "C" D. D. C. certificate. In one particular I think your statement is in error and I would suggest you correct it. We stop issuing the certificate on January 1st next, but I do not know that it has to be registered in any of the provinces prior to that date, in fact as I take it the holder can register it at any time during his life. The important thing is that they take it out before January 1st next. There was not one word said at Council meeting regarding the registering of the certificate before January, so I assume that such was not intended and certainly no minute was made on the subject.

Yours respectfully,  
W. D. COWAN.



## Extension Lectures—Western Canada

GIVEN BY MAJOR W. E. CUMMER, C.A.D.C.

JOHN W. CLAY, D.D.S., CALGARY.

FIFTY-SEVEN men and one lady assembled in the sunroom at the Palliser Hotel, Calgary, on May 27th last, on the occasion of the Extension Course of the Royal College of Dental Surgeons, of Ontario, given by Major W. E. Cummer, of Toronto. The number of registrants had been limited to fifty, and the local secretary proposed to follow out his instructions. The "Verboten" sign was hung out prominently, but a number managed to slip in over the fence. Unlike at the ball game though, they came up to the ticket taker (in this case the secretary) from the inside and registered in



the usual way. It was unfortunate that another dozen or so, who wished to take the course, could not be accommodated.

Winnipeg, Moose Jaw, and Vancouver, made up the other points at which Dr. Cummer stopped, and the reception in these cities was equally enthusiastic. The enterprise of the officials of the R.C.D.S. in promoting and organizing this work, and giving about 200 Western dentists this opportunity should be mentioned, as well as the fact that several members of the C. A. D. C. at each centre, were invited to take the course as guests of the college.

It was the same Dr. Cummer of college days. A pleasant, easy manner of talking, a dexterity in handling air chamber metal on large models (which unfortunately is not easily duplicated with platinized gold), a host of new ideas, which are of great practical use to all of us, and an astonishing array of models and charts, dentures and clasps, and cases finished and unfinished; these are the things that impress as the course proceeds. One cannot but appreciate the cleverness and ability of the lecturer, but back of it all and above all stands the hard, patient and wearying labor which was necessary to evolve these ideas, and to produce so many practical examples of them.





1. EXAMINATION.—Charts, Study Charts and Casts, Etc.  
2. INLAY ABUTMENTS.—For Interlocking Attachments, with Opposing Groves, Plain and Threaded Locking Pins, Splints, Etc. Object to Minimize Cutting.

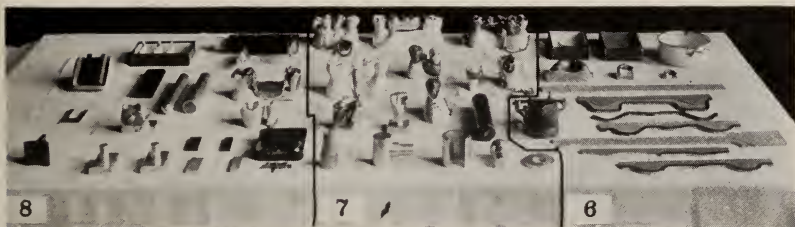
From so large a number of new ideas, it is hard to single out a few for mention. However, the exhibition of a complete series of charts and a detailed explanation of all the factors entering into the question of clasps for partial dentures, was, perhaps, the most interesting and useful part of the course. Most of us went away with a great deal more respect for clasps than had been bred in us in college days, or even than we had acquired later. The clasp for bicuspid and molars with occlusal rest when properly made was shown to be a very useful instrument of retention, while a very ingenious combination of clasp and occlusal rest for cuspids which was demonstrated by Major Cummer is unusually effective.

The method of attachment of clasp to denture, and the outline of partial dentures was discussed very fully, and many new ideas and useful methods of technic were demonstrated. A method of indirect retention devised by the lecturer was shown to be extremely useful, and many other clever devices were discussed which cannot be mentioned here. The illustrations shown on these pages give one a small idea of the carefully prepared material Major Cummer carries to illustrate his work.



3. CROWN ABUTMENTS.—Cope and Dowel, Band Jacket, Indirect Method.  
4. CLASPS—PROPER DESIGN.—Band, Loop, Cast, Double, Friction Lined, Crib, Window, Opposed Wedge, Wire, Half Clasp. Occlusal Rests, Partial and Entire. Special Trays for Individual Plaster Impressions and Melotte's Casts. Substitution Good for Faulty Clasps.  
5. FAULTY CLASPS.—Various Types, including "Stringer."





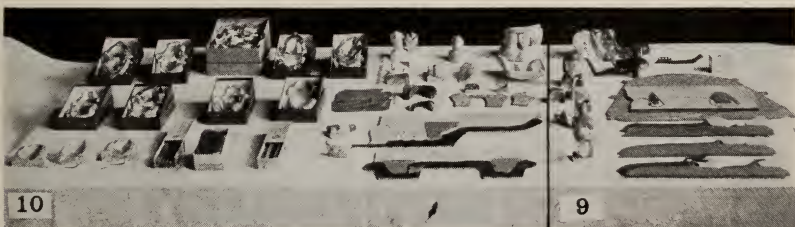
6. ADHESION, COHESION, COMPENSATION.—Correction for Hard and Soft Areas. Correction for Faulty Compensation.
7. NON-PRECISION INTERLOCKING DIRECT RETAINERS.—Stud, Mesial, Distal and Lingual. Ring and Stud, Staple, Mortise, Roach Attachment, etc.
8. PRECISION INTERLOCKING DIRECT RETAINERS.—Chayes, Split Post and Tube, etc.

In short, the whole subject of partial dentures and retention is carefully systematized, and plans for each case are prepared on paper and on models. After a consideration of the various factors entering into the case, a plan is evolved which works out into a denture or removable piece best suited to the requirements of the individual under treatment.

Those who have heard Dr. Cummer have enjoyed and profited by his instruction, and those who have not have missed an unusually practical and useful course of study.

It is to be hoped that some arrangement can be made to get these lectures and suitable illustrations into print for the benefit of those who are unable to receive this valuable information direct from Major Cummer.

Three days of continuous instruction and even one night session. It was a trying ordeal for us old fellows, who have been away from lectures so long, and many a shiny spot was worn by restless ones. The heavy ones produced the best shine. When the shining process had reached the dangerous point, and Dr. Cummer had finished his concluding lecture, Dr. Robb, the Chairman, made a short address of appreciation to Dr. Cummer. Dr. French then arose and showed himself as good a speaker as he used to be a Rugby player, when



9. INDIRECT RETENTION.—Various Contacts, 14-G. Wire, Mesio-Distal, Oblique. Occlusal Pads, Partial and Entire. Double Opposed.
10. TRAYS AND IMPRESSIONS.—Adaptation, Cutting, Bending and Extending Stock Trays. Special Cast Trays. Sectional, Compound and Plaster Impressions. Inset Melotte's Metal and Amalgam Casts.

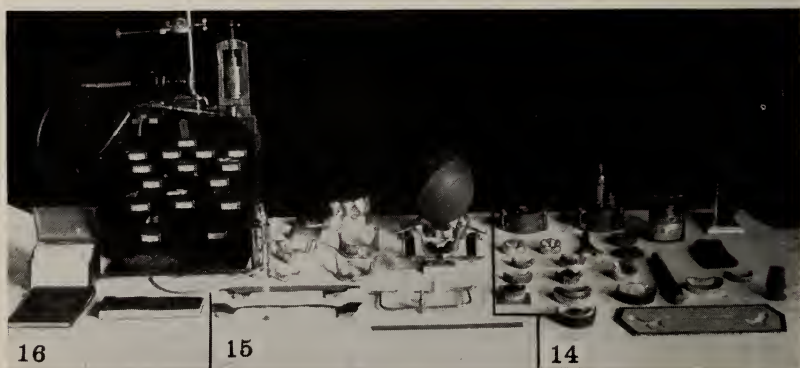




11. CASTS AND ANTAGONIZING CASTS.—Spence's Plaster Compound and Similar Materials, Plaster, etc.  
 12. BASES.—Swaged, Cast, Reswaged, Undercut Casts.  
 13. PORCELAIN TEETH.—Choice, Arrangement, Alteration Color and Form.

he held a place on the Varsity Firsts; and he ended by presenting to Dr. Cummer a Crown Derby Tea Set and Tray, together with the best wishes of the whole class. This event closed an enjoyable and memorable course of study.

This trip of Dr. Cummer's marks a big step forward for the dental profession of the Canadian West. The two hundred men gained a wider knowledge of a branch of prosthetic dentistry, and something more. Each one took home a stimulus to better work in other branches of his profession, and a desire for further study of the same sort. To satisfy this desire, steps are being taken in the four provinces to co-operate so that each year men most prominent in dentistry will come at the invitation of a Joint Committee, to give courses at the principal centres. It is to be hoped that this matter can be carried to a successful conclusion, as it will mean better dentists and better dentistry for Western Canada. More than that, let us hope that this movement will help to develop a united Canadian profession of dentistry.



14. VULCANITE.—Direct and Indirect Vulcanization.  
 15. ANATOMICAL ARTICULATION.—Use of Different Measurements, etc. Special Requirements of Partial Dentures. Position of Teeth to Ridge.  
 16. RECORDS.—Printed Forms for Records, Examination, Service, etc.



## Dominion Dental Council of Canada Examination Results, 1918

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THE results of the Dominion Dental Council examinations held throughout Canada, June, 1918, have been announced by Dr. W. D. Cowan, Secretary-Treasurer of the Dominion Dental Council, as follows:—

*Operative and Prosthetic Dentistry (Papers)*—Adamson, Henderson, Jones, Lebbetter, McCuaig, MacSheldon, Stultz, Sproule, Thompson, Young.

*Prosthetic Dentistry only (paper)*—Laidlaw.

*Operative and Prosthetic (Clinical)*—Adamson, Henderson, Humphrey, Jones, Lebbetter, MacSheldon, Stultz, Sproule, Young.

*Bacteriology*—Aitken, Blondin, Flett, Hall, Hartford, Oke, Ott, Poyntz, Pickard, Richardson.

*Medicine, Surgery and Anaesthetics*—Adamson, Henderson, Jones, McCuaig, MacSheldon, Stultz, Sproule, Thompson, Young.

*Metallurgy*—Aitken, Oke.

*Jurisprudence and Ethics*—Adamson, Henderson, Jones, McCuaig, McCuaig, MacSheldon, Shultz, Sproule, Thompson, Young.

*Physics and Chemistry*—Carrothers, Clermont, Chegwin, Coyst, Day, Fitzpatrick, Hillis, Jones, Milne, Mackenzie, Oke, Palmer, Ross MacSheldon, Shortreed, Thomas.

*Physiology and Histology*—Aitken, Benrzza, Countryman, Carrothers, Clermont, Chegwin, Coyst, Day, Fraluk, Fitzpatrick, Griffin, Germeroy, Hillis, Hughes, Jones, Morrison, Mitchell, Wm., Milne, McLachlan, Oke, Ott, Palmer, Ross, MacSheldon, Strath, Sproule, Thomas.

*Anatomy*—Aitken, Countryman, Carrothers, Clemence, Clermont, Chegwin, Coyst, Day, Fraluk, Fitzpatrick, Griffin, Green, Germeroy, Hesson, Hall, Hillis, Hughes, Jones, Morrison, Murray, Mitchell, Wm., Mitchell, G. F., Milne, McLachlan, Macleod, Oke, Ott, Poyntz, Palmer, Pickard, Quigley, Ross, MacSheldon, Thomas.

*Materia Medica and Therapeutics*—Aitken, Blondin, Corrothers, Chegwin, Clemence, Dimock, Flett, Hall, Henderson, Hartford, Jones, Laidlaw, Murray, Mackenzie, Oke, Ott, Poyntz, Pickard, Quigley, Richardson, MacSheldon, Shortreed, Sproule, Thomas, Wood, Young.

*Pathology and Bacteriology*—Carrothers, Chegwin, Dimmock, Henderson, Jones, Laidlaw, Lebbetter, Murray, MacKenzie, Quigley, MacSheldon, Sproule, Thomas, Young.

*Orthodontia*—Adamson, Henderson, Jones, Lebbetter, McCuaig, MacSheldon, Stultz, Sproule, Thompson, Young.



# Meetings of the Nova Scotia Dental Association and Provincial Dental Board

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REPORTED BY GEORGE K. THOMSON, MAJOR C. A. D. C.

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**M**EETINGS of the Nova Scotia Dental Association and the Provincial Dental Board were held at Truro, N. S., on July 11th, and although the attendance was not large, were most satisfactory and interesting. Reports of the Provincial Dental Board, Dental Faculty of Dalhousie University, Representative of the D. D. C., Committee on Dental Education of the Public and the Department of Scientific Research of Dalhousie University, show that the dental profession of Nova Scotia has been very active during the past year.

The secretary-registrar reported that one candidate had passed the autumn Provincial examinations in 1917, and three candidates, all graduates of the Faculty of Dentistry of Dalhousie, had passed the spring examinations, 1918. Eight names had been added to the dental register during the year, making a total membership of 172, about 20 per cent. of whom are not practising in the province, and twenty-three of the remainder being on military duty.

The report of the Chairman of the Faculty of Dentistry of Dalhousie University, showed the largest attendance in the history of the school last year.

Notwithstanding the disaster of December 6th, 1917, but two weeks of teaching time were lost.

The graduating class and every undergraduate who was physically fit, enlisted at the close of the session.

The Dental Library has been materially augmented with the latest editions and the fyles of journals are being systematically bound. It occupies a section of the Medical Library of 6,000 volumes. This is also open to all dental students.

A research laboratory has been established and already some very interesting work has been done.

The recent military orders will mean much to the classes in the Medical and Dental Schools in Canada. The military authorities will not be to blame if dental students are not forthcoming for the freshmen, as well as all other classes.

The notices of motion from the Dominion Dental Council were dealt with and our representative given instructions respecting the attitude of the Nova Scotia Dental Association toward them.

"Report of Committee on Dental Education of the Public." Several meetings of this committee were held during the year and very creditable work was done in the Halifax School Dental Surgery. Arrangements have also been made for the course of illustrated



oral hygiene lectures to be given to the students of the Normal School by one of the Faculty of Dentistry of Dalhousie University. Interviews with the Superintendent of Education, representatives of the Normal School and correspondence with the C. O. P. A. were also reported, as were the receipt of display cards for use in the schools throughout the province.

In connection with the reports of the Faculty of Dentistry and the Educational Committee the relation of the dental profession to the C. A. D. C. was discussed, and members of the association expressed appreciation of the excellent services rendered in this District.

(1st). A preliminary report from the Dental Research Laboratory of Dalhousie University was presented by Dr. S. G. Ritchie. The research work done by Dr. Ritchie and his colleague, Dr. F. W. Ryan, consisted of experiments in root canal preparation, treatment and filling. The various methods in use were submitted to a rigid microscopical examination, the results tabulated and conclusions drawn.

(2nd). A critical study of the organic contents of the dentine, its relation to focal infection and a method of preventing the same through fixation of the tissue by means of histological technique and an agent suggested by Dr. Ritchie not hitherto used. A new step is introduced into the process of root canal preparation and filling. Numerous slides, sections and preparations made during the research were presented and explained by Dr. Ryan. The report will be published later.

The suggestion that after the war, competitive examinations for applicants for commissions in the C. A. D. C., such as those conducted in the U. S. be instituted, was favorably discussed and the opinion expressed that more co-operation between the corps and the profession would be desirable.

The following officers were elected for the ensuing year:—

*Association.*

President—Dr. M. F. Roman, Antigonish.

Vice-President—Dr. G. R. Hennigar, Halifax.

2nd Vice-President—Dr. R. H. Woodbury, Halifax.

Secretary—Dr. W. C. Oxner, Halifax.

Executive Committee—Above officers with Dr. S. G. Ritchie, Halifax.

Auditors—Drs. G. H. Fluck and F. W. Dobson, Halifax.

*Board.*

President—Dr. F. W. Ryan, Halifax.

Vice-President—Dr. Frank Woodbury, Halifax.

Secretary-Registrar—Dr. Geo. K. Thomson.

Executive Committee—Halifax members of the Board.

A visit to the beautiful Truro Park and Golf Club was much enjoyed and appreciated by the visiting members.



## Standardization in Dentistry

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FREQUENT attempts, more or less successful, have been made to standardize certain operations and procedures in the practice of dentistry. Standardized methods of practice are good providing it is clearly understood that standards are not fixed points but are subject to constant change. In other words, when standardization minimizes progress or interferes with improvement it has gone too far. Alba B. Johnson recently read a very excellent paper before the Chamber of Commerce of the United States, in which the ever present dangers of standardization were clearly dealt with. To quote:

"If, however, it should be urged that the advantages of standardization to which the railroads can work would in the long run be sufficient to compensate for the disadvantages of present increased confusion, then some principle must be discovered by which standardization shall avoid the cessation, if not the extinction, of improvements. Every improvement in some sense involves the destruction of standardization. It would be an evil day for American engineering and for American progress in the art of transportation which would involve a policy of discouragement to new and useful improvements in the art. We should therefore look carefully before we leap, to make sure that we are not giving up the substance of continued growth in efficiency and economy, to grasp the chimera of standardization. Especially should this be considered most carefully when the world-wide danger of this war is upon us.

"It is now being asserted that the delay in executing our airplane-construction program is mainly attributable to the standardization of the motors. But, whether this is true or not, it is evident that very soon our much-advertised 'Liberty motor' will probably be obsolete; for in the keen battle of engineering wits, constantly going on among the engineers of the warring nations, the 'standard' of to-day will undoubtedly form the scrap-pile a few months hence.

"In this connection it is pertinent to speak of a recent remark made by Secretary Lane to the effect that if the Government is to assume permanent ownership of any industry—the railways, for example—it should select only those industries that have become 'standardized.' Mr. Lane is a lawyer, and, although an exceptionally able man, his experience has evidently not been along scientific lines. Otherwise he would never have spoken of a 'standardized industry.' There is no such thing outside of countries like China and India, where men have standardized themselves into rigid classes or castes.

"Is railway transportation a 'standardized industry'? No. Is telephony a 'standardized industry'? 'Far from it,' replied the chief engineer of a great telephone company to the query of a public utility



commissioner. 'I have a son,' said the engineer, 'and I entertain too strong a hope for his future to believe that, if he follows my profession, he will have nothing new to achieve, nothing to do but maintain and operate a system that my associates and I have designed and built.'

"Is farming a 'standardized industry'? It is among the oldest of industries, yet who would dare say that progress in it has nearly reached an end? Luther Burbank has recently written a twelve-volume monograph, the prime object of which is to demonstrate that man has scarcely begun to realize what can be accomplished in the way of improving fruits and plant products in general. By increasing the yield of many plants threefold, by inventing new species of plants, and by entirely changing the habits of plants, Burbank has forever dispelled the illusion that farming can be greatly improved by mechanical methods only.

"No, valuable as 'standardization' may be under certain conditions, it must be remembered that it has many economic limitations, not the least of which is the tendency to sacrifice future progress in order to curtail present waste."

Standardization in dentistry doubtless works out to the advantage of the average man. But in thus taking advantage of the best thought and practice of the moment, let us not fail to play our part in bringing about the improved standard of to-morrow. Standardization does not excuse or debar us from thinking for ourselves or developing to the maximum our own God given powers.

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## War's Emphasis on Health Education—A National Programme of Health Education\*

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THOMAS D. WOOD, M.D., NEW YORK.

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NATIONS are striving to-day, as never before, for the essentials of existence; the conditions of perpetuity; the foundations of prosperity. War throws a spotlight of convincing clearness upon national defects. The youthful confidence and complacency of our overgrown republic are shaken to the depths regarding the elements, the sources of national soundness and vigor. We are beginning to suspect, if not to fully realize, that even more essential and fundamental to the integrity and permanence of a nation than scientific progress, political achievement, industrial development, and economic accomplishment, are biologic soundness and fitness, the health of the people.

This national asset, health, while the most essential, is at the present time the most endangered of all our natural resources. We are appalled at the number of our young men, in both voluntary and draft enlistment, who are incapable of defending their country; who

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\*Address before the National Council of Education, February 28, 1918.



wounded or in any way disabled in the service of the country; and are rejected for military service because of physical and mental defects.

While types of disease and weakness are markedly different in their prevalence in, and effects upon the sexes, still the welfare of the nation is, on the whole, as seriously threatened by the health limitations of girls and women as by those of boys and men.

Some there are who, in view of recent revelations, apprehend this menace to the welfare of the nation. And yet it has been known for years before this great war engulfed us, that seventy-five per cent. of the more than 20,000,000 school children of this country were handicapped by physical defects. While some of the defects, which are incapacitating our young men for military efficiency and which are lowering the ability of our citizens for the business of life, develop in late adolescence or adult life, still many of them exist in the children and youth in our schools.

In the mobilization of our nation's resources for the stupendous task of this war, nothing is more dramatic or impressive than the inspiring spectacle of these young men being trained to preparedness for the intensive, the grim business of war. Records even of men in our great training camps, who have been accepted as fit for military service, show that in multitudes of cases, and within six months after the beginning of training, the improvement in health, in vitality, in physical and general efficiency has been almost incredible. Shall we not provide as thorough and effective health care and physical education for the children of our country as we furnish for the young men in the army and navy?

Lives are being needlessly sacrificed; human power in enormous quantity is left wholly or partially undeveloped; economic loss of staggering extent occurs, because scientific knowledge and practical wisdom are not applied to the prevention of needless weakness and disease, and for the constructive development of the potential health resources of the children of our great country.

The monstrous efficiency of the German Empire in this awful war is due in an important part to the organized health work, the national program of health care and education which has been conducted in that country for the last half century.

The pioneer development in school hygiene occurred in Germany. The movement for open-air schools began in Germany. Many of the best examples of experiment and accomplishment in the field of health education have occurred in the very country which to-day hurls fearful menace at the safety and freedom of the civilized world. We must learn, even from the fiendish success of despotic Germany, important lessons for the solution of vital problems which perplex democracy.

Hundreds of millions are being expended for hospitals, for supplies, for medical care of the soldiers in training; for our men who are



the best that can be done in all of this program is never really enough. Institutions are being prepared for the convalescence of our splendid men who are shattered in hazardous service for all the rest of us. Wonderful and unprecedented plans are being made for the fullest possible reconstruction and rehabilitation of those who are injured in war. Plans are being most wisely made, under the revised requirements of the draft, for the removal and correction of the remediable physical defects of the men who are found to be below the standard of physical fitness. And all of this is as it should be. Too much cannot be done.

But what about the basic needs of the great draft army of the nation's children who must supply the human units of the citizenry of the next generation; who must bear the burden of civilization in peace and in war? What shall we do about the neglect of the children who hold the future of civilization in their immature lives?

Our country is suffering—not only in relation to the war, but in the general program of the nation's advancement—annual economic loss amounting to hundreds of millions of dollars, and human loss of value immeasurable; because the health, the biologic soundness and welfare of the children are so largely neglected; because existing defects are not recognized and cured whenever possible; because the available forces are not mobilized to prevent diseases which might be avoided with intelligent and organized effort; because wisdom is not practically applied to the conservation and development of the most vital of all our nation's resources, the health of the people, and, most important of all, the health of the children and youth. For, let it be said again, the foundations for enduring soundness of the nation must be laid in provisions secured for the health and welfare of the children.

Our schools are wasting enormous sums in educating, or trying to educate, the children who are handicapped by ill-health, when the expenditure of much smaller amounts in a judicious health program would produce an extraordinary saving in economy and efficiency. A dollar spent promptly in a timely, constructive effort to conserve a child's health will be more fruitful for the child and for human society than will a thousand dollars applied twenty years later. The principle of national thrift finds its first and most vital application in the conservation and improvement of the health of the children.

At least one per cent.—200,000 of the 22,000,000 school children in the United States, are mentally defective.

Over one per cent.—250,000 at least, of the children are handicapped by organic heart disease.

At least five per cent.—1,000,000 children have now, or have had tuberculosis, a danger often to others as well as to themselves.

Five per cent.—1,000,000 of them have defective hearing, which unrecognized, gives many the undeserved reputation of being mentally defective.



Twenty-five per cent.—5,000,000 of these school children, have defective eyes. All but a small percentage of these can be corrected, and yet a majority of them have received no attention.

Fifteen to twenty-five per cent.—3,000,000 to 5,000,000 of them are suffering from malnutrition, and poverty is not the most important cause of this serious barrier to healthy development.

From fifteen to twenty-five per cent.—3,000,000 to 5,000,000 have adenoids, diseased tonsils, or other glandular defects.

From ten to twenty per cent.—2,000,000 to 4,000,000 have weak foot-arches, weak spines, or other joint defects.

From fifty to seventy-five per cent.—11,000,000 to 16,000,000 of our school children have defective teeth, and all defective teeth are more or less injurious to health. Some of these defective teeth are deadly menaces to their owners.

Seventy-five per cent.—16,000,000 of the school children of the United States have physical defects which are potentially or actually detrimental to health. Most of these defects are remediable.

One of the appalling revelations of recent years is the conclusion based on unrefuted evidence that the rural school children in this country are handicapped by more physical defects than the pupils in the city schools. While several significant causes seem to be responsible for this astounding condition, the present physical inferiority of country children depends in part upon the fact that city children now receive more health care than do those in rural regions.

Is it necessary to urge that in all of the school children of the country these health defects should be recognized, and that all of the defects which demand remediable attention should be promptly corrected? It is lamentably true that in only a small percentage of the entire school population are the defects studied and recognized, while in only a small fraction of these even, are the detrimental defects corrected in an effective manner.

The business of keeping the school children of this country in good physical repair is, as now conducted, a disgrace to the nation. The great majority of people (many of them generally intelligent) fail to appreciate the significance of these defects. This fact, however, does not lessen in any way the injury to the children of the neglected health defects.

The real danger to the children of the land, as a matter of fact, lies in the ignorance, irresponsibility of, and neglect by, the adults intrusted with, and supposed to be equal to the most important task of the adults of any species: namely, the care and training of the young.

The children of our country deserve as effective physical care as the live stock.

The children are entitled, even in war times, to as careful attention and cultivation as the crops.



Shall not the children, drafted by compulsory education into our schools, be assured of as skillful and satisfactory care as the soldiers in camp and trench?

If health and physical efficiency are then, so important for the country as a whole, all of the necessary forces, both governmental and voluntary, must be marshalled for the task of protecting and developing the physical fitness of the young.

The principle of universal training must, in a manner consonant with the spirit and methods of democracy, be interpreted and applied in the universal, compulsory health and physical care, and training of all the children of the nation. Moreover, a comprehensive program of health training must provide for the education of adults as well as of the children. The children will be the responsible adults of the next generation, but those now of adult age control largely the opportunities of the young in preparation for adult life.

While it is true that many agencies of influence and responsibility are requisite for a comprehensive national health program, still it is equally true that the consideration of any particular phase of this work must recognize the importance of co-operation with other agencies as clearly as the details of its own work.

In a nation with compulsory education and free schools, the possibilities of a health education program are extraordinarily impressive. The acceptance of the rapidly widening social scope of education, in preparing the young for all the privileges and responsibilities of life, carries inevitably with it the opportunity and obligation that the school shall undertake the most important part in the entire continuous program of health education.

Much of the actual health care of the children must be accomplished by the home, by health boards, and by other organizations, both governmental and voluntary. However, the school of the United States is the universal, the officially credited, and the strategic agency to lead in the educational program of health, to standardize the principles involved, and to organize and supervise the social program for the care of the children's health.

A national program of health education, adequate in any way to the essential needs of the situation, must include the following items:

I. Health examination, and supervision of the pupils' health, with provision for the following phases:

A. Daily inspection of pupils, and regulation of attendance at school for the prevention and control of acute and contagious diseases. The children are compelled to attend school at an age when they are peculiarly susceptible to many forms of acute disease and physical defect. The school is, in its very nature, perfectly adapted to serve as an agency for assembling and distributing children's diseases throughout the community, and all too frequently this is just what occurs. The best knowledge and skill of preventive



medicine and the efficient service and co-operation of all available forces—physicians, nurses, teachers, school officials, parents, and even the children themselves are requisite for a reasonable minimizing of these diseases of child life. Every school vitally needs an efficient form of health supervision with medical direction; with the strikingly effective services of properly qualified school nurses; with the essential co-operation of well-trained teachers and of parents willing to do their share in promoting the welfare of all the children.

The methods of controlling and preventing communicable diseases among school children will not be satisfactory until parents and guardians keep away from the school not only the children with "symptoms of recognized (diagnosed) disease," but the children with "signs of health disturbance."

B. Provision for the general health of the pupils should include the following:

1. Health examination and dental inspection, at least once a year, followed by notification and advice to the homes.
2. Follow-up health service by school and district nurses, with co-operation of home and all available organizations.
3. Provision for correction of all harmful, remediable defects by medical and surgical care, and by dental and health clinics. Children handicapped by health defects cannot make the best use of the education offered to, or forced upon, them. Education which pretends to help prepare the children for life cannot logically neglect any element of vital concern in their development.
4. Warm school lunches for all pupils who do not eat warm lunches at home.

Society should not pauperize any home or child, but society for its own welfare should prevent by every possible means malnutrition in growing children. The warm lunch is necessary to the health of every child. The school lunch, as an illustration of principles of nutrition and as an object lesson, is the most effective means of educating the school child, the home, and the community in better ways of selecting and using foods.

## II. A healthful school environment.

The school house and surroundings should be sanitary and attractive. They should be healthful not only when built but also in their maintenance and use. A model school fallen into neglect may be far less salutary in health influence than a cheap, makeshift building well cared for. The schoolhouse should be as sanitary and healthful in all essential particulars as the best home in the community. Further, it should be pleasing and attractive in appearance, in furnishings, and in surroundings, so that the community as a whole may be proud of it; so that the pupils and teachers may receive pleasure in attending school and in caring for and improving it. Healthful and attractive schools are absolutely essential to the physical, mental, social, eco-



nostic, and moral well-being of the children and teachers, and to the life and welfare of the Nation as a whole. Such schools are powerful health agencies, serving as examples of sanitation to all who see them, and affecting healthfully pupils and teachers and all others who come within their influence.

III. A hygienic school management which insures conditions in the highest attainable degree favorable and healthful, in methods and materials of instruction; arrangements of program; length of school day; forms of examinations and tests; methods of grading and promotion; arrangement and supervision of recesses; requirements of home study; and in personality and influence of teachers.

IV. Effective health training and teaching pupils, which is dependent upon:

A. Inculcation of health habits affecting the pupil individually and in relation to the home, school, community, and the State.

B. Instruction in facts, principles, and motives which will provide the best basis for intelligent and effective action.

C. Greater emphasis upon health than upon disease in the program of health teaching.

D. Greater emphasis upon social than upon personal or individual aspects of hygiene.

E. Education of children for responsible parenthood—dependent in part upon two factors:

1. That the teachers should be more comprehensively and thoroughly trained to understand all aspects in the lives of the developing children under their care.

2. That parents should be better prepared for their own part in the education and guidance of their own children.

V. Provision of an adequate and rational physical education, with:

A. Well-equipped playgrounds, athletic fields, gymnasiums, and utilization of all available outdoor facilities.

B. Employment of teachers and supervisors qualified to give sensible and satisfactory guidance to the physical training activities.

C. The acceptance of useful and healthful industrial, vocational and social service activities in the physical training program.

VI. Better preparation of teachers for health education.

If advantage is to be taken of the opportunities offered, and if the responsibilities for health service are to be adequately met, the teacher must be thoroughly trained and equipped for the task. It is important that the teacher should be healthy—a helpful and inspiring example in this whole field of health influence—and intelligent and wise with reference to the wide program of education.

The following factors of improvement seem advisable in relation to this problem:

A. The teachers should be more carefully selected, partly with reference to health qualifications, and they should be more adequate-



ly trained, so that they may direct their own lives more efficiently and through their better knowledge of health laws fulfill more satisfactorily their obligations in the schools and in relation to their pupils, and to the communities in which they work.

B. Society should provide more favorable conditions for the preservation of the teacher's health, and for the improved efficiency of the teacher's work.

The argument, then, for a national program of health education finds rational support in the present stage of social and educational development in the United States, and convincing emphasis for this proposal is projected from the present world crisis and from the lessons to be derived by our democracy from this struggle of civilization.

To provide the essentials of administration for A National Program of Health Education the following propositions are submitted:

I. That a comprehensive, thorough-going program of health education and physical education is absolutely needed for all boys and girls, of elementary and secondary school age, both rural and urban, in every state in the Union.

II. That legislation, similar in purpose and scope to the provisions and requirements in the laws recently enacted in California, New York State, and New Jersey, is desirable in every state, to provide authorization and support for state-wide programs in the health and physical education field.

III. That the United States Bureau of Education should be empowered by law, and provided with sufficient appropriations, to exert adequate influence and supervision in relation to a nation-wide program of instruction in health and physical education.

IV. That it seems most desirable that Congress should give recognition to this vital and neglected phase of education, with a bill and appropriation similar in purpose and scope to the Smith-Hughes law; to give sanction, leadership, and support to a national program of health and physical education; and to encourage, standardize, and, in part, finance the practical program of constructive work that should be undertaken in every state.

V. That federal recognition, supervision, and support are urgently needed, as the effective means, under the constitution, to secure that universal training of boys and girls in health and physical fitness which are equally essential to efficiency of all citizens both in peace and in war.

The possibilities of vital accomplishment in a national program of health education seem not only fundamental for national safety, but limitless for national progress. The significance and necessity of the work to be done makes the demand for constructive advancement imperative. No factor relating to essentials in public education or promotion of national welfare seems more important or more promising.



# ARMY DENTISTRY

By authority of Lt.-Col. Thompson, A.D.D.S., M.D. No. 2  
This Department is Edited by Harry S. Thomson, Captain C.A.D.C.

- ¶ The unselfish and efficient work of the Canadian Army Dental Corps is not yet fully understood or appreciated either by civilian dentists or the public generally.
- ¶ Public appreciation and recognition of Dentistry, during the period of the war, certainly depends more upon the ideals and accomplishments of Army Dentists than upon those of civilian practitioners.
- ¶ The Dental profession and the Dental Corps are not distinct bodies. Their interests are identical. The one is part of the other.
- ¶ In the conduct of this Department, Captain Thomson will be glad to receive assistance from all who are willing to help, and will appreciate receiving personal notes, suggestions, or manuscript describing interesting cases in Army Practice.
- ¶ Address communications to Captain H. S. Thomson, C.A.D.C., North Toronto Orthopedic Hospital, Toronto.

## War Time Dentistry as Preventive Medicine

*"To Canada is due the development of Army dentistry, and, indeed, all the other Allied nations have followed her lead in this direction."*

*—Sir Edward Kemp.*

DENTISTRY as preventive medicine, applied to civilian life, is such a well established fact that it needs no special emphasis at this time; but war dentistry as preventive medicine, has opened up for us fields that would, otherwise, never have been explored, and an excellent opportunity to obtain definite data and the opinions of men, highest up in professional and civilian life, to prove our case.

After four years of war, we can look back and say that we have demonstrated the value of dentistry, not only as preventive medicine, but also as a determiner of the morale and spirit of an entire army—that which we otherwise shouldn't have gained in an entire lifetime. We have in that period had concentrated, under personal care and supervision, millions of men from all countries of the earth, and have been able to observe the physical (and also the moral) effect on the men made "dentally fit," and those that were otherwise.

How much havoc one man, suffering from an aching tooth, can cause in an entire company, may easily be imagined. His own efficiency is impaired, he is neither eating or sleeping well, is a constant grouch and fault-finder, and his condition and actions are more or less reflected in those with whom he comes in contact. Difficulties and hardships become greater and duties are harder to perform. We can easily understand these conditions increasing to the point of the almost disorganization of that man's particular company.

This matter has been particularly well dealt with by Dr. Nodine, writing from France for the American Journal of Surgery. He says:



"Consider for a moment the annoyance, the discomfort and irritation that one diseased tooth may cause in an individual otherwise perfectly healthy. Multiply this several times, then add to it the agony of a body shattered by shell fire, shrapnel fire, rifle fire, liquid fire, asphyxiating gas, bayonet wounds and grenades. Add this to nerves that have been shattered by thunderous and constant roar of heavy calibre guns, the piercing shrieks of light artillery, the vicious grind of machine guns, the horrible boom of trench mortars and the uncanny cries of aerial torpedoes. How man can survive all this is truly wonderful.

"The pain and distress of these aching teeth plus that of the constant agony of terribly lacerated wounds, of infected and shattered limbs and joints, produce such a strain that even iron constitutions weaken under their influence.

"Relieve, reduce or take away any pain, any discomfort, and irritation and the rest may be borne with greater ease and greater fortitude. And nothing will contribute so much to this relief as the removal of or stopping of the pain of aching and diseased teeth, and no personal sacrifice is too great to contribute to alleviation of this vast amount of suffering.

"Again, in another way, these diseased and abscessed teeth are a source of poison. Hidden abscesses on dead teeth furnish micro-organisms and toxins that neutralize the constructive forces of the body. They delay, postpone and overcome efforts of the system to combat the infections that have invaded the body, and retard the healing processes.

"The constant ingestion of food mixed with pus and the discharges of diseased teeth and gums affect the digestion and add another and an internal source of infection for the system to overcome."

The words of the overseas Minister of Militia at the heading of this article, tell in a positive manner that the Canadian Army Dental Corps is doing its best to take care of conditions such as Dr. Nodine has described; and when the history of this war is written, the Canadians can well feel proud of not only the number and quality of fighting men sent "over there," but also of the ways and means we have taken to keep these men up to standard, from the time they enlisted until they are returned to civil life.

The President of the British Dental Association in a speech made recently in London, says: "The Canadian Army is the only army in the whole of the world that attempts to send its soldiers to the front 'dentally fit,' and keep them fit," while Dr. W. H. Dolamore of London, England, President-elect of the same Association, said: "It is difficult to criticize the arrangements in our own army, but one feels that it might be possible and desirable to follow the example which the Canadians have set." Someone has said that "the trouble of being a hero lies in the fact that you must live up to your reputation"; and these statements show how the work of our corps is



being understood and appreciated, and make it doubly important that the same high standard be maintained and that we never lag in any smallest detail. We have attained a high point of efficiency, and have been recognized as one of the most needed units in the whole army.

As Canadians, and perhaps one of the youngest countries in all this war, we have become leaders in the humanitarian work of giving our men our best efforts to help them "carry on" during the war, and also, as far as possible, to make it easier for them to return to their normal conditions in civil life, so that they may return to their families and their friends with added confidence, and a certain pride that they are at least dentally presentable. How much this means to the men only those who have served in returned soldiers' hospitals are able to tell.

CANADIAN ARMY DENTAL CORPS SCHEDULE  
FOR THE HALF YEAR, ENDING JUNE 30TH, 1918, SHOWING  
WORK DONE BY THE C.A.D.C. IN THE BRITISH ISLES.

*Hospitals.*

|                     |        |
|---------------------|--------|
| Men treated .....   | 30,761 |
| Men completed ..... | 8,231  |
| Dentures made ..... | 2,914  |

*Training Areas.*

|                     |         |
|---------------------|---------|
| Men treated .....   | 111,583 |
| Men completed ..... | 44,810  |
| Dentures made ..... | 13,082  |

DENTAL OPERATIONS PERFORMED BY OFFICERS  
OF THE CANADIAN ARMY DENTAL CORPS IN ENGLAND AND  
FRANCE FROM APRIL 1ST TO JUNE 30TH, 1918, AND  
ALSO SHOWING THE GRAND TOTAL OF WORK COM-  
PLETED SINCE JULY 15TH, 1915.

| Total operations<br>reported to: | Fill-<br>ings. | Treat-<br>ments | Den-<br>tures | Prophy-<br>laxis | Extrac-<br>tions | Devita-<br>lizing | Totals    |
|----------------------------------|----------------|-----------------|---------------|------------------|------------------|-------------------|-----------|
| March 31, 1918..                 | 638,984        | 237,064         | 120,790       | 110,021          | 405,560          | 66,095            | 1,578,514 |
| April, 1918..                    | 31,135         | 15,321          | 4,465         | 6,939            | 12,697           | 2,322             | 72,879    |
| May, 1918..                      | 36,687         | 17,541          | 5,694         | 8,876            | 17,047           | 2,800             | 88,645    |
| June, 1918..                     | 34,932         | 16,694          | 5,572         | 7,172            | 14,823           | 2,735             | 81,928    |
| Grand total ..                   | 741,738        | 286,620         | 136,521       | 133,008          | 450,127          | 73,952            | 1,821,966 |

WAR AND LAUGHTER.

"Laugh and help win the war," said one optimist. When laughter is not silliness, when it is genuine merriment, over-riding difficulties and dangers, when it manifests courage and a mental attitude of confidence that would simply find relaxation, then is the injunction worthy of every man's attention. The value of a wholesome laugh in terms of health is undoubted.—The Social Hygiene Bulletin.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**SOLVING THE X-RAY PROBLEM.**—I arrange with an X-Ray laboratory to take pictures for my patients as I need them, the bill to be sent to me at stated intervals. When an estimate is made for a series of operations the X-ray service is included. I may then have as many pictures taken as I see fit without protest from the patient, and without the feeling that I am urging radiographs from mercenary motives. The pictures are sent direct to me and not seen by the patient till I have examined them. In this way I avoid discussion, and my services are valued by the patient.—*R. W. Lee, Dental Review.*

**HUTCHINSON'S TEETH.**—It has been said that Hutchinson's teeth are pathognomonic of syphilis but it is not so. You have all had cases of these small pits that run in lines across the teeth, and if you know your anatomy you can tell at just what time the fever occurred in the child. Any eruptive fever, no matter what, will produce an eruption of the skin, and a disturbance of the mucous membrane will be followed by indentations made in the teeth along their borders or across them, known by surgical writers and syphilographers as Hutchinson's teeth. They are not due to syphilis any more than they are to scarlet fever or any other eruptive disease. They are the result of inflammation which prevented the proper nutrition of the tooth enamel at the time it existed. This statement was indorsed most emphatically by Dr. G. V. Black when I made it many years ago.—*Truman W. Brophy, Dental Review.*

**BASSWOOD FOR COUNTER DIE.**—As a counter die for stamping gold plate over small fusible metal dies in crown and bridge work, procure a piece of inch basswood board and cut it in pieces say two or three inches wide by five or six inches long. Roughly form the gold over the die, and drive it on with an ordinary hammer using the end grain of the basswood against the gold. The gold is properly stamped in five seconds. Saw the stamped end of the basswood block off as needed. Basswood is fine grained, soft, does not split easily and stamps the gold true.—*F. D. Price.*



**IONIZATION.**—In electric ionization the conducting wire, electrode holder, and active electrode should all be so light in weight that they may be easily supported by the tooth or root being treated. Make a light holder by running about an inch of ordinary copper bell wire into the rolls to flatten it and wind this thin, flat part in a spiral around the base end of an ordinary barbed brooch. Let the base of all active electrodes be made to slip into this spiral spring holder. A barbed brooch makes a splendid active electrode where the metal does not matter. This holds properly a very small amount of cotton at the tip and also prevents the electrode from slipping out of the root canal.—*F. D. Price.*

**TO PREVENT NAUSEA IN IMPRESSION TAKING.**—Paint the soft palate with the following solution: Cocain hydrochlorid, 0.25; menthol, 0.10; phenol, 1.00; distilled water, 50.00.—*M. A. Horwitz.*

**ROOT CANALS.**—Persistent, conscientious cleansing and medication of root canals through properly enlarged access or approaches is more than half the secret of success in the final result of useful roots. Hhurried, improper first work leads certainly to conditions which perfect root filling cannot render successful.—*Grafton Munroe.*

**USING BEESWAX.**—When beeswax is left immersed in water that is too hot, its useful working qualities are impaired. A blanching or whitening of the surface shows that it has been heated to too high a temperature. A rather large volume of water at the right temperature (about 40 degrees to 50 degrees C.) should be employed and full time allowed for the beeswax to become warmed and softened throughout.—*D. M. Shaw, Dental Record.*

**TO CLEAN CAST GOLD AND INLAYS.**—In a small rubber cup (hard rubber) I have a solution of hydrofluoric acid, about two-thirds water, in which I place my inlays for many hours, always over night. Of course, they should be cleaned by heated sulphuric acid, two-thirds water, first. You have no fumes nor splash and get brighter gold.—*J. W. Landrum.*

**COLOR CONSIDERATIONS IN SELECTING ARTIFICIAL TEETH.**—The following factors must be taken into account and guarded against if we would make successful matches of color in selecting artificial teeth. A bright object appears brighter when put alongside of a darker one, and vice versa. And just as an object that is placed alongside of red takes on a greenish tinge, so the human teeth appear greenish when seen surrounded by the healthy red tissues of mouth and lips. Thus teeth that in themselves are of a decidedly orange hue will often appear greenish yellow as a result of their being surrounded by very red tissues. In short, the factor of negative after-images and simultaneous and successive contrast tends to make the teeth appear of a different hue and a different brightness when inside and when outside the mouth.—*Journal Allied Dental Societies.*



# ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, SEPTEMBER, 1918

No. 9

## EDITORIAL

### Canadian Organization for Dental Research

ATTENTION is drawn to the Report of the Dental Research Committee of Canada, appearing elsewhere in this issue, outlining plans for raising funds for dental research in the Dominion of Canada. The plans and organization suggested in the report, received the unanimous approval of the Canadian Dental Association at its recent meeting, and, doubtless, will be loyally and generously supported by the individual members of the profession from end to end of the Dominion.

During the 1918 convention of the National Dental Association in Chicago, a complimentary banquet was held at which a number of prominent American citizens spoke, including Surgeon-General Gorgas, Brigadier-General Noble and Dr. Mayo, the eminent surgeon. Dr. Mayo took occasion to refer in a most complimentary way, to the great work that has already been accomplished by the Research Institute of the National Dental Association and reminded those present that the funds of the Institute had been largely contributed by the dentists themselves.

Dr. Mayo stated that he had, as a member of the medical pro-



ession, sometimes felt ashamed of the very humiliating and undignified position in which his profession had placed itself by accepting funds from certain sources outside the profession itself, and expressed the hope that dentistry's more worthy example of independence and self-sacrifice might soon be emulated by Medicine, and that the various activities of the profession might be adequately supported and maintained by the contributions of the members of the medical profession themselves. These were most encouraging words. They will cause every dentist who has contributed to the funds of the N.D.A. Research Institute, to feel proud that he has had some small part in the association's research work.

Only a small proportion of dentists have either the ability or training to actually carry on Laboratory Research. To the average dental practitioner, the payment of a few dollars annually is about the only contribution he feels competent to make to Dental Research. But these few dollars enlist the Dentists' interest. Therefore the wisest and best plan for organized Research includes the opportunity for personal contributions from individual dentists.

To thus secure the unselfish interest of the members of the profession, is in itself a great step forward. But this is only the first step. It is vitally essential that the active co-operation of the practising dentists be also secured, that Scientific Laboratory Test and Clinical Experience may be closely linked together. In all successful research work science and practice must work hand in hand.

The C.D.A. is to be complimented upon its decision to follow along the lines laid down by Weston Price and the N.D.A. in organizing Research Work in Canada. When the opportunity is given put your weight to the wheel and help move Canadian Dental Research along in the interests of better dentistry and more scientific practice.

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## Fill up the High Schools

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“**E**VERY year witnesses the strange spectacle of thousands of children dropping out of school life just at the entrance to the high school,” says the Guardian, in a recent issue. To quote further: “Somehow or other the impression has gone abroad that the high school is only for those who purpose to enter professional life, and all others are supposed to complete their education in our public schools. To many of us this seems to be a most unfortunate and costly mistake, and we should like to see it remedied at once. When England is preparing to extend the age of compulsory education to sixteen years, it is surely time that Canada took action in this matter.

“The fact that in the past men got along fairly well with two or



three years' education is no excuse for allowing the children of to-day to enter life similarly handicapped, for there can be no doubt that lack of a good education is a handicap and a serious one, and no one realizes it quite so clearly as the man who has been successful in spite of it. Many a man who is deservedly honored and trusted by his fellows, and who is serving them in some public capacity, even while he knows that he is doing good work for the public, smarts under the sting of the fact that he is an uneducated man, with an uneducated pen and an uneducated tongue. And if this is true to-day it will be still more true to-morrow. There is no need of our boys and girls being thus handicapped, and parents should see to it that they are not.

"In some cases the difficulties in the way are very great, but in most cases they are only very trivial. One writer puts it this way: 'It is positively shocking how trivial have been the circumstances deciding the high school non-attendance. Distance is no longer a sufficient reason, except in rare cases. Farmers have failed to allow their sons to start in September, and then the boy wouldn't go after two or three weeks have passed. Girls have felt their dress was not good enough, and so sentenced themselves to wear poor clothes all their lives. Horses have had a lame leg; trains go an hour too early or too late; the baby sister was sick, or the weather was too hot in September.'

"Such excuses may seem sufficient now, but they will look pretty small when the boy grows up and begins to realize his handicap. It seems to us that every parent who has suffered from the disadvantage of a meagre education should see to it that his boys and girls are not placed in the same situation, while the parent who has had the advantages of a good education will surely be content with nothing less for his children. It may be that the boy or girl does not realize the need of a high school education, and it should be the parents' business to make that need plain to them; and preacher and teacher can help in the matter. Canada is entering upon a new era of national development, and that development will be helped or hindered as our citizens are intelligent or unintelligent. If you believe that education assists intelligence, see to it that the boys and girls get all the education that it is reasonably possible for them to acquire."

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### Analgesia Indicated

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For there was never yet philosopher  
That could endure the toothache patiently.

—Much Ado About Nothing.



## How to Fight Spanish Influenza

**S**URGEON-GENERAL GORGAS, of the United States Army, has issued the following recommendations for the avoidance of contagion.

"1. Avoid needless crowding; influenza is a crowd disease.

"2. Smother your coughs and sneezes; others do not want the germs which you would throw away.

"3. Your nose, not your mouth, was made to breathe through. Get the habit.

"4. Remember the three Cs—a clean mouth, a clean skin, and clean clothes.

"5. Try to keep cool when you walk and warm when you ride and sleep.

"6. Open the windows always at home at night; at the office when practicable.

"7. Food will win the war if you give it a chance; help by choosing and chewing your food well."





LIEUT.-COL. W. G. THOMPSON,  
*A.D.D.S., M.D., No. 2.*  
*Canadian Army Dental Corps,*



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, OCTOBER, 1918

No. 10

## Canadian Army Dental Corps, Military District No. 2

FRED J. CONBOY, D.D.S., TORONTO.

IT is generally conceded by all those who have made a study of military dentistry, and who are familiar with the workings of this military district, that in point of organization, equipment and excellence of work it stands supreme, but few fully realize the amount of work and sacrifice necessary to accomplish such excellent and desirable results. Few there are, who realize what great and rapid strides have been made in army dentistry or the difficulty of the tasks, which confronted those responsible for this great progress. While we were all engaged in our ordinary work, comfortably situated, enjoying the association and companionship of our friends, while we were enjoying great financial and social prosperity, like a bolt from the blue came the occurrence which caused the declaration of war. Event followed event with such rapidity that before we were fully aware of its awful significance, our nation was an active participant in this great world crisis.

Then, the appeal came to the dental profession to do its part, and how nobly the men responded. Many relinquished lucrative practices, left comfortable homes, and relatives more dear than life itself, and sacrificing life's ambitions, took their places in that great army which is to win for the world a higher and grander liberty than has hitherto been its heritage. They placed their all upon the altar of sacrifice, anxious to faithfully play their part in humanity's great struggle for freedom and liberty. At the outbreak of the war, there was no Canadian Army Dental Corps; previous to that time dental operations had been performed during the periods at camp, but the military dentists were a part of the Army Medical Corps. When war was declared and enlistment began, men by hundreds and





C.A.D.C. Building—Camp Borden

thousands presented themselves for enrollment, who, while they were anxious to join the army and were otherwise physically fit, had to be rejected because of the condition of their mouths.

Canadian dentists, both military and civilian, soon realized that the hour of their opportunity and responsibility had arrived, and that they were to have the opportunity of adding to the fighting forces of the Empire by making these men dentally fit. The profession had still another field of service in caring for those, who while fit to pass the test, needed much dental treatment in order to protect their health and increase their comfort and efficiency. With such a large task before it the question of organization became a live issue; could the military dentists be of more service and do better work if operating



Entrance to Lt.-Col. Thompson's Tent—Camp Borden



under the Army Medical Corps or as a separate unit? After a very careful canvass and survey of the whole situation, the preponderance of opinion was in favor of operating under an independent establishment, and we are pleased to state that the military authorities concurred in this opinion.

Military District Number Two is to-day a large, well-organized, well equipped military unit, but like many other great institutions, it had a very humble origin. A small number of patriotic, public-



C.A.D.C. Clinic—Exhibition Camp

spirited dentists worked faithfully and well under conditions most unsatisfactory and discouraging, without proper rank or recognition, and with an equipment absolutely inadequate. And yet they labored on, for they knew that they had the support of their fellow-practitioners and were rendering a service which would be beneficial to their fellow-men and bring undying glory to their beloved profession. Prominent among the men associated with the corps at this time were Lieut.-Col. Guy Hume, who at his own request was sent overseas and there took up at Orpington, that work which was to make him so renowned, and Capt. Trelford, who also asked to be sent overseas. When Capt. Trelford left, Lieut.-Col. Walter G. Thompson became the A.D.D.S., of this district.

Lieut.-Col. Thompson, who is a big man in the right place, had at the time of his appointment served fifteen years in the militia, five



years as a private in the ranks and ten as a military dentist, and the full and accurate knowledge of military affairs thus gained, helped considerably in making his work such a pronounced success. Public-spirited, fair-minded and generous to a fault, he enjoys the confidence and esteem of all those with whom he associates. His years of satisfactory service at military camps brought him in close contact with many men of high military rank and position, and he was thus enabled to more readily approach these men, and the views he expressed carried added weight and influence.

Lieut.-Col. Thompson is not only held in the highest esteem by his superior officers, but he also enjoys the supreme confidence of every member of his corps. He demands painstaking, faithful service, feeling that the man who is not willing to sacrifice for his country and his fellow-men should have no place in the Dental Corps, but when a man gives his best service he is absolutely sure of just and honorable treatment. Lieut.-Col. Thompson has exercised great care in the selection of his staff and is to-day surrounded by dentists who are the gems of the profession, men who know their work, are thoughtful and considerate of their patients and above all broad-minded, self-sacrificing and patriotic. Not only in the purely professional branch of the service, have the very best men been secured, but also in the clerical and supply departments the most capable men were obtained. This outstanding ability and reliability of the members of the corps has meant much in its advancement and success, because these men have been able to work side by side with the medical and other military officers without friction and the kindest feelings of confidence and co-operation have always prevailed. Col. Thompson possesses great ability as an organizer and administrator, and as a result we find the unit efficient in every department of work. From his very first day in office he has steadfastly adhered to the policy of providing proper equipment for his men, rightly contending that without adequate equipment the best work is impossible, and as a reward of his indefatigable efforts in this direction he is able to provide his men with equipment equal to that in the offices of the best men in civilian practice, and this is as it should be. Surely the men who are preparing to serve, or who have returned wounded after serving their country and fellow-men upon the dreaded battlefield should be given the best that modern dentistry can provide.

For the benefit of those who may not have an opportunity to visit the different clinics, I will give a short description of the dental department at Spadina Military Hospital. This clinic is supplied with the most modern equipment, making it possible for the operator to do Oral Surgery and the treatment of Trench Mouth, as well as carrying on a general practice.

The equipment consists of a Pelton and Crane Cabinet Switch-board and Automatic Air Compressor, an Electric Sterilizer, Fischer





C.A.D.C. Clinic—North Toronto Orthopedic Hospital

X-ray outfit, Ritter Chair and Electric Engine, Ransom and Randolph Dental Cabinet, S. S. White Flush Spittoon and Aseptic Bracket and Table. The Dental Laboratory is also modernly equipped with compressed air and the latest electric appliances, thus enabling the mechanics to make splints for the numerous fracture cases that present.

The work of the corps consists in performing the numerous operations necessary to make the recruit dentally fit for overseas service and in treating the diseases, correcting the defects and supplying the lost parts in the mouths of the returned men. The former service is rendered at clinics connected with the different camps, while the work for the returned men is done at the military hospitals. Some slight idea of the amount of work done by the corps may be gleaned from the following table, which records the operations from June, 1916, to August, 1918:—

|                                |        |
|--------------------------------|--------|
| Amalgam fillings . . . . .     | 48,529 |
| Cement fillings . . . . .      | 40,200 |
| Root fillings . . . . .        | 6,770  |
| Synthetic fillings . . . . .   | 8,445  |
| Pyorrhoea treatments . . . . . | 6,525  |
| Prophylaxis . . . . .          | 14,333 |
| Extractions . . . . .          | 74,910 |
| Anesthetics general . . . . .  | 320    |



|                                       |         |
|---------------------------------------|---------|
| Anesthetics local .....               | 70,970  |
| Dentures .....                        | 8,977   |
| Number examined .....                 | 52,553  |
| Special cases (bridges, crowns) ..... | 1,783   |
| Number of operations .....            | 452,064 |
| Number of patients treated .....      | 105,414 |

As would be expected in dealing with so many men, and especially with patients, who have passed through such trying experiences, a large number of special cases present themselves. We will report three which were recorded during the month of July:—

Cadet B.—Fracture of maxilla from upper left wisdom to upper right wisdom, around the entire arch, one-half inch above the gingival margin. Drawn into the proper relationship by the application of 10 ligatures united to the lingual and labial arch. The maxilla was then brought into close apposition to the lower, by ligatures united to all the teeth in upper.

Lieut. K.—1st D.B.C.O.R. X-ray showed two deeply impacted wisdom teeth (lower) causing nerve pressure and consequent pain and giving rise to constantly recurring sore throat and facial neuralgia.

Treatment: Under ether anesthetic, cut away bone tissue overlying both of the impacted teeth, and removed the two offending members. Time, one and a quarter hours.

Special report No. 3.—Spent three hours during the week in investigation of causes for Trench Mouth in the Pathological Laboratory. Carrying out a series of experiments from swabs taken from returned soldiers with the idea of isolating what form or forms of bacilli (bacteria) exist and endeavoring to secure a serum for curative purposes. Have so far discovered a very essential treatment in the curing of Trench Mouth, but would like to experiment on guinea pigs, rabbits and white mice to develop some antitoxin or anti-serum, which will counteract the malignancy of this virulent organism.

The Corps is composed of:—

Lieut.-Col. W. G. Thompson, Officer-in-Command Military District No. 2, Headquarters, 786 King St. West, Toronto.

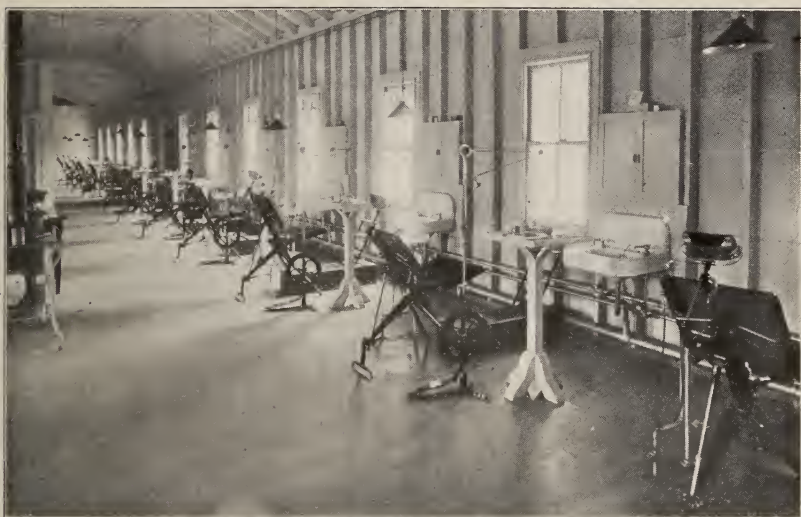
Major J. G. Roberts, Officer-in-Charge, C.A.D.C., Spadina Military Hospital, Toronto.

“ W. E. Cummer, Officer-in-Charge, Plastic Surgery, Military District No. 2.

“ H. A. Semple, Officer-in-Charge of Discharges, C.A.D.C., Park School, Toronto.

Captain B. R. Gardiner, C.A.D.C., Niagara Camp.





C.A.D.C. Surgery—Camp Borden

- Captain W. J. McL. Dolson, Officer-in-Charge, C.A.D.C., R.A.F.,  
Long Branch, Ontario.
- “ R. R. Walker, Officer-in-Charge, C.A.D.C., Niagara  
Camp.
- “ J. J. Teetzel, C.A.D.C., 240 College St., Toronto.
- “ R. S. Woollatt, Officer-in-Charge, C.A.D.C., 240 Col-  
lege St., Toronto.
- “ F. W. Barbour, Officer-in-Charge, C.A.D.C., Base Hos-  
pital, Toronto.
- “ H. S. Thomson, Officer-in-Charge, North Toronto Ortho-  
pedic Hospital.
- “ W. W. Thornton, C.A.D.C., Niagara Camp.
- “ J. W. Grainger, C.A.D.C., Niagara Camp.
- “ H. J. Hodgins, Officer-in-Charge, C.A.D.C., Whitby  
Convalescent Hospital, Whitby.
- “ L. D. Leonard, C.A.D.C., Long Branch, Ontario.
- “ G. F. Zimmerman, Officer-in-Charge, C.A.D.C., Toronto  
General Hospital.
- “ C. H. Fowler, Officer-in-Charge, C.A.D.C., Polish Camp,  
Niagara Camp.
- “ J. A. Ross, C.A.D.C., Jesse Ketchum School, Toronto.
- “ C. C. Maclachlan, Officer-in-Charge, C.A.D.C., Brant  
House, Burlington, Ontario.
- “ J. W. Turner, Officer-in-Charge, C.A.D.C., Niagara Falls,  
Ontario.
- “ H. E. Smith, Officer-in-Charge, C.A.D.C., Base Hospi-  
tal, East Hamilton.



- Captain J. R. Crockett, C.A.D.C., Base Hospital, Toronto.
- “ J. M. Sheldon, Officer-in-Charge, Jesse Ketchum School.
- “ W. H. McLaughlin, Officer-in-Charge, C.A.D.C., R. A.F., Beamsville, Ontario.
- “ W. J. LaFlamme, C.A.D.C., Niagara Camp.
- “ F. C. Thomson, Officer-in-Charge, C.A.D.C., R.A.F., Leaside Camp, Ontario.
- “ C. F. Lewis, Officer-in-Charge, C.A.D.C., R.A.F., Camp Borden, Ontario.
- “ G. Coveyduc, C.A.D.C., Long Branch, Ontario.
- “ R. A. Dunlop, Officer-in-Charge, C.A.D.C., R.A.F., Burwash Hall, Toronto.
- “ C. W. Canning, C.A.D.C., Niagara Camp.
- “ J. C. Allan, C.A.D.C., R.A.F., Beamsville, Ontario.
- “ F. S. Loucks, C.A.D.C., 4 John St. North, Hamilton, Ont.
- “ R. E. Hassard, Officer-in-Charge, C.A.D.C., Military Convalescent Hospital, Toronto.
- “ H. K. Richardson, Officer-in-Charge, C.A.D.C., Special Hospital, Camp Borden.
- “ J. J. Lonergan, C.A.D.C., Niagara Camp.
- “ W. W. Macdonald, C.A.D.C., Niagara Camp.
- “ W. S. Madill, C.A.D.C., Toronto.
- “ R. D. Thornton, C.A.D.C., North Toronto Orthopedic Hospital.
- “ J. F. Rollit, C.A.D.C., Camp Borden, Ontario.
- “ J. H. Gunter, C.A.D.C., Base Hospital, Toronto.
- Lieut. T. Ingram, Officer-in-Charge, C.A.D.C., Hamilton Mountain Sanitarium, Hamilton.
- “ G. M. Singleton, C.A.D.C., Niagara Camp.
- “ S. J. Phillips, C.A.D.C., Niagara Camp.
- “ H. D. Leuty, C.A.D.C., Niagara Camp.
- Hon. Capt. and Q. M., J. D. Webb, 786 King St. West, Toronto.
- Lieut. W. Gilbert, Acting Adjutant, C.A.D.C., Military District No. 2, 786 King St. West, Toronto.

In describing the work, organization and equipment of the Canadian Army Dental Corps, we would be sadly remiss in our duty, were we not to mention the kind, helpful and sympathetic assistance given the Corps by two of Canada's great Military men, Major-General Mewburn and General Logie. These men were quick to recognize the great value of the work of the military dentists and were anxious to actively aid their efforts to make the lot of the soldier more comfortable and the army more efficient. They had full confidence in the ability and judgment of Lieut.-Col. Thompson, and so the Dental Corps and the dental profession has had staunch friends and supporters in these two prominent men. The dentists join with their fellow-citizens in expressing a great debt of gratitude to the



Minister of Militia and General Logie. When General Logie went overseas, there was considerable apprehension on the part of the profession as to the measure of support which the Corps would receive from his successor in office, and we were delighted when Lieut.-Col. Thompson assured us that Col. Bickford was just as friendly to the Corps as was his predecessor, and would give them every support in their efforts to render the men efficient dental service.

While on a recent visit to the clinics we were privileged to speak to the officers commanding the different camps and hospitals, and they were unanimous in expressing the high value placed by the military authorities upon the work of the dental unit.

Sir Robert Borden, Major-General Mewburn and Sir Edward Kemp, the Overseas Minister, have spoken of the Dental Corps in a most complimentary manner, and so, under such capable leadership and enjoying as it does the unbounded confidence of the public, the military authorities and their dental confreres, there is every reason to believe, that the Dental Corps of this Military District will go on from its present great success to still greater and greater successes in the future, and will add still greater laurels and bring still higher honor to the dental profession.

The civilian dentists unite in expressing the gratitude of the profession to Lieut.-Col. Thompson for the important part he has taken in the development of military dentistry, and wish him and those associated with him, every success in their important beneficent and honorable work.

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## The Dental Educational Association

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FOR some time past many of our Toronto dentists have expressed a desire to take up, during winter months, a definitely organized course of study along some line in dentistry.

There are also many others who desire to become connected with a clinic club. To make this possible the Dental Educational Association has been formed.

A number of classes or study groups will be organized so that each member will be able to take up the subject of his choice. Each group or class will select its own teacher or instructor.

General meetings of the Association will be held, at which matters of common interest will be discussed. A provisional executive has been formed, also a provisional constitution, a copy of which will be mailed each practitioner, giving date of first meeting.

It is proposed that the present executive will remain in office only until the organization is complete, when a general election will be held.

The provisional officers are:—President, Dr. Fred J. Conboy; Vice-President, Dr. Harold Clark; Secretary, Dr. H. A. McKim; Treasurer, Dr. W. B. Amy.



## Impressions of the Chicago Meeting

BURTON LEE THORPE, D.D.S., M.D., ST. LOUIS, MO.

*(The influence of the world-war was felt by all who attended the combined National and Canadian Dental Conventions at Chicago. The presence of members of both the United States and Canadian Army Dental Corps, as well as extensive clinics and exhibits of a military character served to vividly remind the delegates that a war was in progress,—a war that has played upon the heart strings of individuals and nations. The display everywhere of the flags of the Allies was an ever-present token of friendship and esteem. But notwithstanding all these things the more potent influence was the indescribable “feeling in the air” of cordiality and an utter lack of restraint or reserve. We all knew we were friends and allies.*

*Amid the iconoclastic influences of war it is gratifying to be able to point to this building-up of mutual confidence and affection between two peoples who have heretofore been more or less indifferent to one another’s “joys and sorrows.” Canada and the United States have been friends and at peace for a hundred years, and as close neighbor, no nation was more keenly interested than Canada, in the attitude of the United States toward the great war. None more sincerely welcomed the Americans into the league of allied nations than the Canadians. Hereafter we shall not only be friends, but will remain allied for truth and freedom.*

*Oral Health is glad to publish Burton Lee Thorpe’s impressions of the Chicago meeting, and particularly to welcome him as a contributing editor to the pages of this journal. Canadians already know Dr. Thorpe by reputation and will look forward with interest to his contributions, from time to time, to the pages of this journal—Editor.)*

AUGUST 5th to 9th will not soon be forgotten by those of the six thousand dentists of Canada and the United States, who jointly enjoyed the many good things for professional advancement on exhibition at Chicago.

The only real trouble with the meeting was that it was unwieldy, i.e., too much of it that time and human endurance did not permit one seeing or doing.

The President, Col. W. H. G. Logan, and his efficient co-laborers of Chicago, deserve much credit for their far-sighted perfection of details in arranging for and expediting the work of the meeting, which went off with such clock-like precision. The meeting had a military air throughout; there was present every kind of army man from General down to Lieutenant. Personally, I was mighty glad to be a private, as I did not have to salute some one every other



minute, and therefore, avoided the "Charlyhorse." The Canadian Dental Corps' members, in their picturesque uniforms, were the hit of the convention with the ladies.

The presence also of Surgeon-General Gorgas and his party at the meeting was a treat to we civilians. From them we got to know some things they had accomplished in the past, and some things in their planning for the future.

The exhibition drill by a company of Dental Corps' officers, (recent graduates of the training school at Camp Greenleaf), was a revelation. It showed what physical training would do for the average plethoric, lazy dentist, and, we believers in compulsory training, long for the day physical requirements are inaugurated by our Government. Instead of a man with a physique boasting in the future, "I am a self-made man," he will proudly say: "The Army made a man out of me." These U. S. Army Dental Corps' School men, also conducted an interesting exhibit showing charts, models and restorative appliances used in teaching at the school, war-time methods in dental surgery. The Canadian Army Dental Corps also conducted a most interesting clinic showing practical cases of war prosthesis.

The clinics were too crowded and too many, to be absorbed in the limited time allotted to them. The Denver Inlay Unit was the feature of the clinic session.

Another feature of the meeting was the Black Historical Exhibit, prepared by Dr. Wm. Bebb. This occupied one of the parlors of the Auditorium Hotel and was a marvel, showing the former office of Dr. Black, the instruments and appliances he used, his work shop, laboratory, library with its original manuscripts, published articles, books, etc., scientific instruments and other inventions.

If one had never appreciated the greatness of G. V. Black before, after seeing this wonderful exhibit of his life's work, they must have left it with a greater appreciation of the man and his immense contribution, not only to our profession but to the world. As a boy, Abraham Lincoln said: "I will read and study, and maybe my chance will come." Lincoln and Black were both poor boys and young men on the prairies of Illinois, with the same undying ambition to succeed and excel, and both left for themselves a name and fame that few reach; and it was acquired, in both instances, by work and study. The example of their lives should be known to every youth in the world, as an encouraging lesson that they may strive by the example of high ideals and the righteous lives of these men. I could but think of the words of he who said: "Thou, O Shakespeare, in our wonder and astonishment hast built for thyself a life long monument," applied most aptly to Dr. Black.

This exhibit rightly and properly should be taken over, housed and maintained for the future by our National Dental Association as a permanent memorial to America's greatest dentist.



Another, possibly the greatest feature of the meeting, was the fine tribute to Dr. Black, i.e., the unveiling of the life-like bronze monument of him, which is placed opposite the Plaza Hotel, corner North Avenue and Clark Street, in Lincoln Park. This is a beautiful tribute to the life work of Dr. Black, who has enshrined his name in the hearts and homes wherever dentistry is taught and practised in every civilized country in the world. It is said the Boche in *uncivilized* Germany, at times have given him credit for his scientific standing and contributions.

The monuments in the past, erected by the appreciative members of their profession to Horace Wells, the discoverer of Anaesthesia, at Hartford, Conn., and in Paris, France, and the memorial to Horace H. Hayden at his birth-place at Winsor, Conn., and the monument to Wm. T. G. Morton at Boston, and last, this monument to G. V. Black, make us realize that the great contributors to our calling and to the world's betterment, are not forgotten, and that their works live after them.

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Chicago is the warmest place in the summer and the coldest place in winter I have ever visited. The Chicago men cannot be held responsible, however, for the hellish weather we experienced. It would have been criminal trying to compute the value of the ice on the ponds and lakes the Canadians skated over so carelessly last December.

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Dr. John V. Konzett, of Dubuque, Iowa, one of America's most progressive practitioners, teachers and clinicians, was elected President, and New Orleans (in October, 1919), the next place of meeting.

It was worth the price of a trip across the continent, to say nothing of the benefit derived from the meeting, to meet and fraternize with such hale congenial souls as Drs. Joseph Nolin, Wallace Seccombe, Sydney Bradley, A. E. Webster, Frank Woodbury, and a host of other "Canucks," all likeable fellows, who make you feel at once they are the sort of fellows you would like to go fishing with.

It was a fine spirit exemplified at this meeting of the C. D. A. and N. D. A., and I hope it will soon and often be repeated. Why not? There's nothing between our countries but an imaginary line anyway; besides, we are Allies now, fighting for a freedom that is to make the world a better place in which to live.

Mary Roberts Rinehart in her last book, "*The Amazing Interlude*," sums it all up in what the people of Belgium and France long for,—“The right of honest folk to labor in their fields, to love, to pray and at last to sleep in the peace of God.”

Welcome that day of a victorious peace and in the meantime  
ALL HAIL OUR CANADIAN BROTHERS.



## Heroic Sacrifice of Lieut. J. G. Roberts



THE Royal College of Dental Surgeons and the profession of dentistry deeply mourn the loss of Lieutenant James Gersham Roberts, or to speak of him as he was affectionally called by his fellow-officers—"Bobs."

The late Lieutenant Roberts graduated from the R.C.D.S., in 1915, and immediately enlisted for overseas service. He was attached to No. 4 Base Hospital, University of Toronto, and rendered good faithful service with that unit while at Salonika. In July, 1916, he was stricken with Enteric Fever, and though hovering at death's door for over a week, he made rapid recovery, and was invalided back to England. Upon discharge from hospital he refused a proffered three months' furlough, choosing rather to immediately take up work in the Canadian Army Dental Corps in England. It was not long, however, until Lieutenant Roberts decided to get over to France with one of the combatant units. He felt his duty lay "over there" and so anxious was he to get over, that he reverted to private for the purpose of expediting his transfer. Toward the end of April "Bobs" was attached to the 78th Battalion (Winnipeg) and being a fully qualified officer and a man of unusual force of character his influence was soon felt, and he was respected and loved by all his associates. He carried on heroically with his battalion until the "final-call," which came in action on August the tenth, 1918, while fearlessly leading his platoon in one of the recent big offensives that have shaken the very foundations of the Hun's defences.

Lieutenant Roberts reached his objective, being the first man, and though seriously wounded, continued to direct and encourage his command until the end. While being carried from the field by two stretcher-bearers, a German shell exploded near by and killed all three. Lieutenant Roberts was laid to rest far behind the lines in a quiet hillside, but the judgment of his fellow-officers is that, "his memory will long live and spur us on to the end."

Lieutenant Roberts is the only son of Major J. G. Roberts, of Brampton. Major Roberts has charge of the Dental Service at the Spadina Avenue Military Hospital, Toronto. Major and Mrs. Roberts may well feel proud of the record of such a boy, and know they have the deepest sympathy of the dental profession in their great loss.



# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A\*SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## CAUSES AND PREVENTION OF DENTAL CARIES.

**S**ELECT a dozen or more dentists and ask them the cause of caries and you will probably receive a surprising variety of answers. This is a hopeful sign because it shows that attention and thought is being given to this subject. Unanimity on a question of such importance as this is, sometimes indicates a condition of stasis—a dangerous foe to scientific progress. The varied theories which have been advanced regarding the cause and prevention of dental caries are all being investigated by our research workers, and no doubt we shall soon be in possession of valuable information as the result of their endeavors.

In setting forth some of the views held regarding the cause or causes of dental caries, we might quote the opinion of W. H. O. McGehee, M.D., D.D.S., of Cleveland, because it is in effect a summary of the opinions held by many of our dental investigators. Dr. McGehee recently read a most comprehensive paper on dental caries before the Ohio State Dental Society. This paper was reported in last month's issue of "the Dental Summary."

In the opening paragraphs of his essay the author proceeds to tabulate what to him appears to be the rational exposition of the causes of caries. He intimates that he is quite aware that "most of the factors mentioned are now accepted, but some of them have been denied as unfounded by certain investigators." The tabulation of the factors concerned in tooth decay follows:—

### A. LOCAL FACTORS:—

1. Fermentation of carbohydrates.
2. Formation of bacterial plaques.
3. Accumulation and putrefaction of proteids, affording a nidus for the localization of fermentable material and harmful bacteria.
4. Increased deposition of mucin, resulting in acceleration of plaque formation.



5. Excessive excretion of glycogen (fermentable) in the saliva as a result of faulty metabolism by the liver, of carbohydrate foods, or of irritation of the pituitary body by reflex action from pathological dentition and similar causes.
6. Diminution in the amount of alkalinity of the saliva, the natural cleansing and acid-neutralizing agent.
7. Irregularities of the teeth.
8. Abnormal interproximal spaces and improper contact points (natural or artificial).
9. Defective tooth structure from faulty union of enamel plates, imperfect deposition of calcium during formative periods, cracks in or fractures of the enamel, hypoplasia of the enamel and dentin, and similar conditions.
10. Recession of the gums, exposing unprotected dentinal surfaces at the necks of the teeth.
11. Improper habits of mastication.

B. SYSTEMIC FACTORS:—

1. Improper dietary; (a) excessive carbohydrate diet, accelerating glycogen formation, which finally reaches the saliva; (b) excessive consumption of sugars, stimulating the increased deposition of mucin; (c) improper nourishment of infants, (bottle-fed), resulting in improper metabolism of calcium salts with resulting poor tooth-and-bone formation; (d) lack of lime-containing articles of food; (e) insufficient water in the dietary.
2. The sedentary life, resulting in lowered bodily vigor, anemia, leukaemia, digestive disturbances, mal-nutrition, faulty metabolism, acidosis, nervous exhaustion and similar disorders with consequent lessening of the vital resistance of the entire body, including the teeth.
3. Lowered bodily vigor from any cause, including inheritance and disease processes of any character, resulting in the production of poor tooth development during the formative stages, or of retrograde metamorphosis in the same organ during the later periods of life.
4. Affections of the ductless glands, resulting in (1) increased deposition of glycogen in the blood and saliva; (2) interference with calcium metabolism in the tissues of the body, including the teeth; (3) as well as other imperfectly understood pathological changes.

Rather a formidable list of causes, yet even a casual survey will serve to show that a large number of them can be remedied through the co-operation of patient and dentist. The only factor not under direct control is that of inherited defective tooth-structure, but even here much may be accomplished if wise prophylactic measures are instituted in time.



If we acknowledge the possibility of preventing caries "then," says Dr. McGehee, "we will have to acknowledge that the odium attached to the continued prevalence of this condition, certainly, as far as the local causes are concerned, rests on the shoulders of our own profession, because we are the individuals to whom the public and the State will eventually look for its eradication."

Right living, we have seen, plays an important role in the conservation of tooth tissue so that best results are possible only in those cases where the dental and medical professions co-operate. Much interest is being taken as a result of war conditions in the dietary and hygienic questions, so that we may confidently look for a growth of interest in these subjects by the laity.

It has been stated that a great many of the causes of dental caries may be traced to carelessness of the individual, both as regard the food he uses and the general hygienic conditions under which he lives. However, the weight of this charge is somewhat lessened by Dr. McGehee when he says, "that it is conceded by many that decay of the teeth is not a disease in itself, but simply a symptom of the general physical deterioration of the race. It is well recognized, of course, that the environment in which the teeth are placed plays a large part in the production of the condition and certain prominent investigators are claiming that external environment is the only factor concerned, failing to recognize the fact that this is controlled largely by internal factors." Such civilization factors as diet, heredity, the sedentary life, increased brain work, neurasthenia and lowered bodily vigor all tend towards the growth of dental caries, irrespective of what the local conditions may be. Dr. McGehee sums up for us the whole situation in these words: "The ability of the micro-organisms to form bacterial plaques is due, in quite a degree, to the presence or absence of mucin, as well as to other causes. The tendency to the accumulation, fermentation and putrefaction of carbohydrate and protein food debris is regulated among other things, by the rapidity of the flow and the alkalinity of the saliva. The presence or absence of glycogen in the saliva is concerned because it is capable of fermentation; at the same time, all these agencies are entirely dependent on the civilization factors."

A point of remarkable importance is emphasized by the author when he says that vital teeth are capable of offering a certain amount of resistance throughout their periods of usefulness to the inroads of pathologic processes. In support of this contention, Dr. McGehee argues in part as follows: "The pulp is the formative organ of the dentin, and after tooth formation is complete, it remains to furnish nourishment via the dentinal tubules, to the structure. The dentinal fibrils are bathed in a serous exudate of living protoplasm, which is exuded from the trophic pulp. On the life of the pulp depends the existence and welfare of the teeth. . . . When the tooth is sub-



jected to abnormal influences such as caries, abrasion, erosion and other similar conditions, the pulp responds in the form of a vital impulse and interposes a wall of resistance against the attacking agencies, in the form of a transparent zone, tubular calcification, or secondary dentin. Hypersensitive dentin is also the result of the vital action. These phenomena are never found in pulpless teeth. . . . When the pulp of a tooth is removed for any cause, the enamel is much more subject to cracks, fractures, splitting off from the surface of the dentin, and rapidly progressing caries. . . . Arguing the question from a chemical standpoint; when the pulp is removed from a vital tooth a change of matter occurs in the tooth. In change of matter (organic or inorganic) there always is a change in chemical composition. In a non-vital tooth there is a continual chemical change taking place. The germs present in the mouth act more readily on the dead organic matter in the tooth than they do on living matter, while the acids of fermentation act the more readily and forcibly on the inorganic constituents of the tooth, depending upon the frequency with which the latter are changing their molecular relationships."

It would seem imperative from the foregoing views—views which are representative of a large class of capable investigators—that our methods of prophylaxis must undergo a radical change. Even the methods used by our prophylactic experts seem very crude and entirely inefficient in view of the fact that they are aiming solely at the local conditions and ignoring entirely, systemic causes. Granted that a small measure is better than none; still we should aim conscientiously to improve upon the generally accepted hygienic methods now in vogue. To get at the root of the evil we must correct the systemic conditions first. So long as our methods of living remain as at present, little progress can be expected towards the eradication of dental caries. We have been taught to look upon various systemic ailments as being, in some measure at least, the effect of pathological conditions of the teeth and their related tissues, whereas we might well have been pointing to these dental lesions as the manifestation of general systemic disorders. Perhaps it would be best to consider seriously both view points.

The task as it faces our profession to-day may be summed up in these words of Dr. McGehee: "The physician and dentist must work hand in hand for the broadcast dissemination of an increased knowledge and recognition, among other causes, of the importance of the evil effects of lack of exercise and fresh air, of the contamination of the blood stream and tissue cells of the body by the toxins and poisonous products of deranged digestive organs, and a clogged colon; of the evil effects of uneugenic intermarriage, and of all the other harmful results of disobedience of the laws of hygiene."

#### MODELLING COMPOUND IMPRESSIONS FOR FULL DENTURES.

In spite of the introduction of newer methods for taking impressions,



there are many who find satisfaction in the use of modelling compound. Dr. B. B. Todd, of Atlanta, Ga., is one who still favors this material. However, he would have us understand that there are severe limitations in its use.

In his paper, a report of which is to be found in the August issue of "Dental Summary," he says: "Full dentures require modelling compound for obtaining the best results, but as an impression material for orthodontic purposes, crown and bridge-work, (except saddle bridges), it does not rank or even come in the same class as plaster."

All are agreed that the purpose of an impression is, not only to reproduce a model of the tissues at rest, but rather to ascertain the exact position that these tissues will assume normally during the stress of mastication. Now Dr. Todd holds a view which at first sight seems to be contrary to prevailing theories. He contends that where soft or muscular tissues are involved, both the plaster impression and the present method of taking it are decidedly wrong, as well as the idea that an air chamber in the centre of a denture is essential to hold it against a strain of mastication. Again, he is of the opinion that plaster should not be used to take impressions of any case where retention is to be secured by "so-called suction," or where soft and movable tissues have to be dealt with. "The greatest comfort in a plate," says Dr. Todd, "can be obtained only when you have equalized bearing on the soft and hard tissues when they are in their working position. This equalization must be done in the impression in the mouth; and in order that there may be no doubt about the finished product, the so-called impression must be the exact model of the supposed plate so far as height of rim, thickness of edges and length of plate in the rear are concerned."

Impression compound is held to be superior to plaster because of the impossibility of obtaining these features in any plaster impression, due to the mouth being open and the muscles of the cheek and the soft palate in an abnormal position. When the mouth is open the muscles are in a distended condition, hence the finished denture will show spaces all around the rim. It is true that when the denture is in position and the patient opens the mouth a condition of tightness around the rim, may be apparent, but we have to consider that the denture is used most with the mouth in a closed position, hence the need for obtaining accurate fit under these conditions.

We are told in this paper that by making the edges of lower dentures conform accurately to the muscles when in their natural working position, we shall secure one of the essentials necessary to comfort viz.: "Should the plate be dislodged from its correct position, the action of the muscles of the tongue and cheek will automatically carry it back to place without any effort on the part of the wearer."

In handling lower cases where the ridges are almost wholly covered with loose tissue and free-moving muscle, it is very important to get



an impression of these muscles as they are under normal biting stress so that they will be under equal tension when in use. It is better to equalize the pressure over hard and soft areas by judicious use of the modelling compound, rather than by scraping, or in any way interfering with the model.

Taking up the question of nausea, when the patient tries to keep the denture in the mouth; Dr. Todd gives this explanation: "The fact that the patient gags when a plate is in the mouth does not mean that you should shorten the plate but that it should be lengthened until the edge of the plate can be embedded into the soft tissue, or if necessary, into the soft palate so that the tissue will be drawn taut over the edge of the plate. The tickling sensation caused by the soft tissues vibrating under the edge of the plate, is the cause of most all the troubles of nausea or so-called gagging. If you will trace some compound across the back of the plate, and have the patient close and force it up into the soft tissues you will rid the patient of this tickling sensation."

If compound impressions are taken carefully and trial plates made so as to check up the various details such as muscle attachments, rim fit, etc., then excellent results may be looked for, but says Dr. Todd, "if you are going to use the method carelessly and indifferently, you will get better results with plaster."

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MENTAL FORAMEN MISTAKEN FOR ALVEOLAR ABSCESS.—Gray has placed the mental foramen one-fourth inch below the apex of the second bicuspid, but it does not always stay there. When the professional radiographer shows it to have wandered too near the root end it then becomes a mental foramen abscess or rarification and out comes the tooth. Ha! Ha! Serves you right. Why didn't you consult your dentist?—*L. E. Custer, Dental Review.*

REMOVING PLASTER FROM VULCANITE DENTURES.—The dental laboratory worker sometimes finds, on removing a plate from the flask after vulcanization, that the mold or model plaster has formed a hard and strongly adherent layer of crystals on the surface of the vulcanite. Prevention is, of course, better than cure, and one ought not to be so careless as to leave the flask in water for some hours after vulcanization. In cases where one can afford to wait for the gradual action of a slow solvent, the following method will be found very satisfactory: The well-washed plate should be immersed in a strong or saturated solution of sodium hyposulphite—photographers' "hypo"—and left in this solution overnight. On removal from the solution, it will be found that, in many instances the incrustation has been entirely dissolved. Should some crystals remain on the plate, they no longer adhere closely, and they can be readily brushed away, leaving the vulcanite surface quite clean.



# ARMY DENTISTRY

By authority of Lt.-Col. Thompson, A.D.D.S., M.D. No. 2  
This Department is Edited by Harry S. Thomson, Captain C.A.D.C.

- ¶ The unselfish and efficient work of the Canadian Army Dental Corps is not yet fully understood or appreciated either by civilian dentists or the public generally.
- ¶ Public appreciation and recognition of Dentistry, during the period of the war, certainly depends more upon the ideals and accomplishments of Army Dentists than upon those of civilian practitioners.
- ¶ The Dental profession and the Dental Corps are not distinct bodies. Their interests are identical. The one is part of the other.
- ¶ In the conduct of this Department, Captain Thomson will be glad to receive assistance from all who are willing to help, and will appreciate receiving personal notes, suggestions, or manuscript describing interesting cases in Army Practice.
- ¶ Address communications to Captain H. S. Thomson, C.A.D.C., North Toronto Orthopedic Hospital, Toronto.

## Team Work

It ain't guns, nor armament,  
Nor funds that they can pay,  
But the close co-operation  
That makes them win the day.

It ain't the individuals,  
Nor the army as a whole.  
But the everlastin' team work  
Of every bloomin' soul.

—Rudyard Kipling.

*The war has taught us many lessons of the efficiency of organization and team work, so let us take advantage of what we have learned, and with the Canadian Army Dental Corps as a nucleus, apply its principle of organization to civilian practice, and thus be in a position to do a broader and more effective work for humanity.*

THE one permanent element necessary for the carrying on to successful completion of any organization, be it Commercial, Sporting, or Military, is harmonious Team Work, and what a lot we have learned about the efficiency of Team Work during these last four and a quarter years of war. The last months particularly, with all the allied armies united into thorough co-operation under a single control, has more than proved itself, and from that, we, as dentists, should immediately begin to take advantage of what we have learned and apply it to our own profession.

Dentistry to-day cannot accomplish the great task that is set before her, by individual activity, for the task under normal conditions was immense, but under the abnormal conditions that the war has brought



about, and the results of the great educational work being done to the hundreds of thousands of our soldiers by the Canadian Army Dental Corps, the task unless handled scientifically and by organized team work will be overwhelming, and, perhaps, beyond our control.

Wonderful efforts have been put forth in the past by individuals, and great things have been accomplished, for which we are very grateful, but dentistry cannot keep the place she has now obtained, nor in nowise take the place that is offered to her for the future, without the combined united action of every member of the profession.

The work is too great, and the time is too important, for us to consider a past in dentistry and dental organization, what we must work for is the present and the future, and this gives no place for rival organizations, grievances, nor serious differences existing. Let us all throw away these small misunderstandings and jealousies, and get down or up to our real duties, let us look out for the little things, for the Scripture says: "'Tis the little foxes that spoil the vines."

Many different organizations must exist, as our country is large, but let us see to it that they are all working along to the same definite end.

The Canadian Army Dental Corps is an example of what "team work" can accomplish. Four years ago it did not exist, and when the call came hundreds of our dentists, from all over the Dominion, gave up their established practices and gave their best efforts to make an organization that would not only do what it was established for, but would do that work better than it was ever done before. And that is just what it has done, and to-day we can point with pride to the position we have attained, and to the history of the work that has been accomplished, that has placed Canada in the very first place in dentistry in the whole world.

And now let us see to it that Canada keeps that place. "In times of war prepare for peace." Let us organize from coast to coast. Let each town and city that has two or more dentists, form study clubs and research committees, and not only study the scientific side of our profession, but the economic as well, and above all let us study seriously the humanitarian side, for it is only from that side and with that end in view that we can accomplish any worthy results. Let us see to it that all of our school children have an equal chance to have their mouths kept healthy and their teeth in order, for if this can be done, and is necessary for an army, how much easier can it be done and how much more necessary that it be done for our growing boys and girls, not only for their own happiness and efficiency, but for the value they are as an asset to the state, and for the comfort and safety of those with whom they come in contact.

One writer has said: "The greatest of human blessings is health, but anything that gives us freedom from pain, increased capacity for enjoyment, and greater ability to serve without increasing the



expense of human existence or energy, is not only a physical blessing, but beyond question of great economic value."

How far have we advanced in Canada along lines of scientific research? Very little has been done, and that only by individuals working alone. Team work applied to research can accomplish no end of good, the man who has been working alone, will then find someone with whom he can compare results and they can then get in touch with a larger organization, which can in turn be linked up with our colleges and universities, and in this way we can prove our theories and try out our experiments. The need of this scientific study is becoming acute, due to the new awakening in our profession to its real sense of duty. Too long have we been content to treat the condition instead of looking back into the history and tracing the cause, too long have we been content to fill teeth, rather than stop teeth from decaying. Chayes in his new work on Endocrinodontia, says: "We have become so obsessed with the pathologic anatomy of the case that we fail to recognize the ever receding voice of God in the individual struggling with all the normal that is in him, to overcome the very picture we take as a guide in our treatments. It is so in dentistry, we see the teeth of children decay, and we either remove the teeth and disturb the arch, or we fill the teeth which have decayed, and allow the child to go with the predisposition to decay in the constitution, unrestricted to work its further havoc.

"We see a case of so-called traumatic occlusion and we begin to file and grind the teeth into more or less acceptable stress relationship, paying no attention to the particular 'ism' in that particular constitution which caused the arrangement of teeth ultimately bringing about the traumatism that sent the patient to us in search for relief.

"A woman becomes pregnant, bears and gives birth to a child, many of her teeth begin to decay, she loses one or two of them, during the period of lactation; she seeks our advice and help, and we dentists, in almost every instance, fill the decayed teeth and replace the lost ones and dismiss her to go through the same dental ordeal, should she be called upon, in her relation as a wife to become procreatively active.

"Time to change about seems to me, time to realize that we have not been dealing with the fundamental facts of the cases in our treatment of diseases.

"All this does not mean revolution, neither does it mean a reactionary programme, it simply means a broadening of our vision; a more comprehensive understanding, and hence a more effective service in our field of endeavor."

This necessary change in our profession requires new treatment for a new situation and that new treatment can only be a success when we, one and all, get the new vision, and endeavor by united action and team work, to promote the very best means to equip



us to "carry on" creditably to ourselves, and give to every person coming under our care what is justly due them, and the treatment that should be given by the members of a scientific profession. The greatness of the ideal is very often the inspiration that carries us beyond our vainest hopes, so let us as a profession "hitch our wagon to a star," and try in a fair and unselfish way to work in harmony, and organize for efficient team work. This will give us more self-reliance, a greater respect for ourselves and render us capable to do a work that will make the world better for us having lived in it. The new element and the new situation that has arisen from the work of our Canadian Army Dental Corps have brought Canada into prominence over the entire world, and our system has been and is being copied every day. This has been a stimulant to the men that make up the corps to concentrate every effort to keep the standard up to the high level at which it has been placed. The C.A.D.C. has endeavored to give our soldier the very best service in the most modern and aseptic manner possible under the conditions existing and to do it in a manner that will impress upon him the comfort and benefits to be gained by keeping himself and his family "dentally fit."

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The following letter from the Toronto Sunday World shows the interest the general public has in our Corps:—

The work of the Canadian Army Dental Corps overseas is making quite a stir in army circles in England and France. A recent letter to Sir Auckland Geddes, minister of national service, from the British Dental Association contained the following:

"In numbers alone, the fact that the whole of the British forces have only a little more than twice the number of dentists belonging to the Canadian Army Dental Corps is surely very significant, and as regards organization and administration, the inferiority, as compared with the Dominion forces, is equally manifest to those who are familiar with the details.

"At a time when the last reserves of the country are being drawn upon, and the raising of the age limit is, we believe, being considered, it does seem to us very remarkable that so much man-power in the army among munition workers and the rest of the civil population should be wasted from lack of dental attention. The dental service in the army is both insufficient in personnel and inefficient in organization. We are aware of the seriousness of this statement, but we are prepared to support it."

In suggesting the remedy the letter, which is signed by the president, the chairman of the representative board, the hon. treasurer and the secretary, among other things, expresses the opinion that the organization should be similar to, but not necessarily the same as, the Dental Service of the Dominion.



## FIGHTING DISEASE.

In the department of mouth hygiene our dental services have done particularly important work. Infectious stomatitis, a very common and most baffling mouth infection, has been brought under control in the Canadian forces to an extent quite unknown in the other armies. This is the disease to which the misnomer "trench mouth" has been applied. It is not in any way confined to men in the trenches, since thousands of cases appear among those who have never seen the trenches, neither can its origin in any way be traced to the trenches.

As its name (infectious stomatitis) implies, it is infectious—exceedingly so. It is no respecter of rank or sex. Generals and soldiers and their children of both sexes have been treated by the C.A.D.C.

In battalions it can be spread by the use of dishes. In canteens and in some areas it has been prevented from spreading by keeping the dishes of those already infected separate. Children have contracted it, presumably by kissing their soldier father. In one case where five or six men lived in the same house and worked in the pay corps, shortly after it appeared in the mouth of one it was necessary to treat all in the house for the disease. The slightest carelessness in disinfecting the mouthpiece of a gas mask in a school where courses in gas measures are taught might cause an infection to spread widely. An instance of this kind occurred in one of the areas where a great many men were using the same mask. Moistening the finger in dealing cards has also been suspected of causing it in one case in particular.

The importance of controlling and eliminating this trouble will be immediately appreciated when it is said that in many cases when they first apply for treatment, the person infected simply cannot bite or chew food. The prevalence of the trouble will alike be appreciated when one learns that in the six months from July, 1917, to December, 1917, 5,397 patients were treated in Shorncliffe, Bramshot, Witley, Stafford and London alone, and that about fifty per cent were cured. In attaining this end it was necessary to administer 31,802 treatments.

## BRUSHES FOR EVERYBODY.

In the treatment of infectious stomatitis, not the least important part of the treatment is to bring about a cleanly condition of the mouth. The men of the C.E.F. are each issued with a kit containing a tooth brush, but until recently no dentifrice. There was a time when a goodly number of tooth brushes found their way to the buttons on the tunic rather than the tooth in the mouth. The importance of cleansing the teeth has been strongly impressed by the Dental Services on the soldiers, and as a result in this respect conditions have greatly improved. The introduction of 10,000 tins of special dentifrice, invented by the Canadian Army Dental Corps' experts, for use of the oral pathology department, will produce inestimable results both



in assisting the dental officers in their efforts against infectious stomatitis and as a preventive against occurrence of the trouble.

Recently a patient, after unsuccessful treatment in a London hospital, was informed that he must have his teeth extracted. To make a long story short, he is now under treatment in the Canadian Army Dental Corps' oral pathology department, and will probably not have to lose his teeth, nor will the government be placed under the expense of supplying plates for him with which to masticate.

One of the features of the Canadian Army Dental Corps' treatment of "trench mouth" is rapidity and accuracy in diagnosis. With the use of a microscope, the specialists can tell the patient positively in a very few minutes whether he has or has not the disease. The New Zealand forces, whose Dental Corps is particularly efficient, requested that their officers be allowed to study the Canadian system, and two officers have already been returned to New Zealand for the purpose of introducing the Canadian method of treatment there.—*From the Sunday World, Toronto.*

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#### NEW ESTABLISHMENT FOR THE AMERICAN DENTAL CORPS.

The new establishment for the American Army Dental Corps allows one dental officer for every five hundred troops, instead of one for every thousand as heretofore. This change which the American dentists have been striving to obtain for some time, places them on the same footing, numerically, as the Canadian Army Dental Corps.

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#### THE HIGH HEART.

*The following letter from an American officer  
breathes a spirit of reverence and service.*

MUCH has been written about the superb courage and elan of the French and British soldier, but words are imperfect media through which to picture them. Only one thought is uppermost as one, who has never been under fire, hears from their own lips how these brave men calmly and without fear go forward cheerfully to certain fate, led by their officers whom they trust in life and death. Yet these men are peaceful and home-loving, like our own citizen-soldiers, and do not kill for mere lust of slaughter. Those who escape, shattered and broken for life in their glorious young manhood, have no regrets that they are flung out of the battle, driftwood on the fiery waves. It was their duty and they ask no more. Wounds, agony, death—all are mere episodes, and the individual is content to be only an atom in the large design. This is what keeps them to their hard task, and this will keep them to the end.

One is silent before this. "It is high, I cannot attain to it."

There is only one possible solution to this psychological problem. It is not solely a question of military discipline, of mere physical en-



durance. "It is the Spirit that quickeneth," as Sir Douglas Haig has always held, and who is more competent to judge? "Moral" we call it in formal definition, but it is deeper than that, for only great souls can inspire such deeds.

One's viewpoint changes over here. We wonder if we shall stand the test of battle and be ready for the supreme sacrifice. We must. There can be no swerving from the path that lies before us, stretching far into the unknown future and ending God knows where. The high traditions of our corps must never be forgotten. Only the high heart can keep us strong and true to the end.

H. C. COE,

*From the "Military Surgeon."*

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## Army Dental Fund, Military District No. 2

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SOME of the bank drafts sent out in connection with the Canadian Army Dental Corps' Fund have not as yet been returned, and so it is impossible to present a complete report. The subscriptions already sent in amount to nearly thirteen hundred dollars. In order to show their appreciation of the interest civilian dentists have taken in their work and welfare, the members of the corps have decided to issue a special button, which will be sent to all those who have sent in their five dollar subscription. They request that the dentists wear this button as an indication of the fact that they are supporters of the corps. We would like those who desire to contribute, and have not already done so, to send in their cheque as soon as possible, so that a complete report of the fund and a list of the subscribers may be published in the next issue of the Dental Journals.

FRED J. CONBOY,

Secretary.

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## Prince Edward Island Dental Association

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THE Prince Edward Island Dental Association held its annual meeting on the 25th September, 1918. There was a good attendance. The following officers were elected:—

President—Dr. C. B. Green.

Vice-President—Dr. A. B. Reid.

Secretary Registrar-Treasurer—Dr. J. S. Bagnall, re-elected.

Drs. C. H. Beer and F. S. Lodge were elected to complete the Council.

J. S. BAGNALL,

Secretary

Charlottetown, P. E. I.,

September 30th, 1918.



# Ontario Dental Society

## ORAL HYGIENE COMMITTEE.

THE Ontario Oral Hygiene Committee has issued the following bulletin to the members of the Dental Profession in Ontario:—

The following suggestions are intended to assist you in your efforts to introduce Dental Inspection into the schools of your locality.

The initial procedure would naturally be to place the proposition before the members of the local School Board, who have the power to grant the necessary authority. Most school boards, it is found, need considerable instruction on this matter, backed up by public opinion, before any definite action will be taken.

Public opinion may be created in various ways as follows:—

- (1) Enlist the sympathy and support of the editor of the different papers in the town, and have published regularly, short, telling articles on the importance and care of the teeth.
- (2) Get in touch with the Women's Institute Branch in your community, and arrange to give a lecture on the subject (illustrated, if possible), at some special meeting. Have this meeting forward a resolution to the School Board urging the necessity for better care of the children's teeth.
- (3) Take the Public School Inspector into your fullest confidence, and if possible, arrange for an address or paper on the subject of Oral Hygiene at the next teachers' convention.
- (4) Finally, arrange for deputations representing all these bodies, to wait on the Board of Education, urging immediate action.

Generally speaking, such a propaganda, if energetically carried out, will meet with success.

Having gained the necessary authority from the School Board, the next step is to see that the plan is put into immediate execution. In this the resident dentists will be expected to give material advice and assistance.

Remember at the outset that the work is two-fold in character—Dental Inspection, and Dental Education. They are of equal importance, and must go hand in hand.

The regular yearly inspection and all educational work, such as lectures to the teachers, children and mothers, should not be entrusted to any other than the regularly qualified dentist. The services of a qualified nurse will be necessary and valuable in assisting the dentist, and in carrying out the follow-up work, such as forwarding reports to the parents, etc.

Examination charts and any information in reference to the details of the examination and follow-up work may be had by addressing the secretary of the Central Oral Hygiene Committee, Dr. N. S. Coyne, 241 St. Clair Avenue, Toronto.



# PRO BONO PUBLICO

This Department is edited by **Fred J. Conboy, D.D.S.**, and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

THE following article recently appeared in the *Toronto Sunday World*, and is worthy of wider circulation among daily or weekly papers. Pass it along!

## Good Teeth and Better Health

There have been and always will be some few people, who neglect the lesser details and pay great attention to what they regard as the more important. Of course when we speak of the care of the teeth, we do not necessarily mean that one must spend much money on gold fillings or the teeth will not be kept in proper condition. The trouble lies in the beginning, when the teeth begin to give a little trouble, proper care of the teeth should be given when the children are small. It is a well-known fact that only in the last few years have people awakened to the fact that good health and good teeth are intimately related. Many of the common ailments to which the human being is subject may be traced to the disregard for the first principles of a healthy body, i.e., care of the teeth.

Under ordinary circumstances, teeth that are in a perfectly healthy condition, so prepare the food in the mouth that the digestion of food in the stomach is rendered very easy. Unhealthy teeth on the other hand do more damage to food than the stomach can possibly repair. For instance, any tooth from which part of the enamel has been removed usually has a cavity in which food particles lie untouched for days, weeks and even months. In this cavity decay takes place, gases from bacteria lodge, these give off odors most disgusting. The bacteria needs warmth, moisture, and undisturbed food on which to flourish and they find all that is necessary in the cavity of the tooth. As the bacteria multiply rapidly the cavity increases in size, the tooth crumbles, parts break off, nerves become exposed and the poisonous gases generated, affect the nerves causing trouble of one type or another. In fact there is no pain to compare with the ache of a tooth, for not only is one tooth apparently affected; but the whole jaw, side of face and even the head seems to ache. When a tooth aches it is utterly impossible for food to be chewed as it should. To overcome the subsequent pain from the chewing process, many will



resort to soft foods, which are simply rolled about the mouth by the tongue, and swallowed before properly fit for digestion. During all this period any food taken by mouth is treated exactly the same and bolted rather than chewed, with the result that symptoms of indigestion appear. Instead of the stomach being able to do its work properly, it is taxed beyond its strength, and its chief duties are neglected; other organs such as kidneys are overtaxed to get rid of accumulated poisons due to indigestion and constipation. Even the blood of the individual is not in a good condition, hence lack of nourishment is felt by the body tissues, and such symptoms as headache, loss of appetite, neuralgia or rheumatism appear. Of course there may be other causes for the very same symptoms but it is well, as a precaution, to just see what is the condition of the teeth, gums and mouth.

The simple tooth brush plays a great part in the general health. Teach children to use the brush early, but see that the brush is suitable. Adults might also see that the brush used is not too large to reach well back between the cheek and the teeth. Giving the teeth a thorough brushing at night is splendid, for dislodging the day's accumulation of food particles. As a matter of fact, the thorough cleansing of the teeth at night before retiring seems most reasonable, especially for those who find it impossible to brush the teeth during the day. Fortunately for the children, where medical inspection is in vogue, teeth are looked after, but for those of the rural districts not quite so fortunate, it should be the business of the parents to see that the teeth are properly cared for. The practice (so common in rural districts) of extracting teeth for the first ache is a practice which should be strongly condemned. Extracting a tooth here and there soon makes it impossible for proper mastication of food with symptoms which have been mentioned appearing soon after extractions. Teeth should be treated not extracted.

Many mothers neglect their own teeth simply because they believe that the family purse will not cover all the expenditure. It does seem quite an outlay, and especially if the teeth have been so neglected that a great period of treatment is necessary. It is a thing to be regretted that so many mothers do neglect their teeth, for on the mothers usually falls the greater work of looking after all the family in sickness as well as in health, and it is only under such strain as sickness in the home that the previous good care of the body tells. It is a common, but most erroneous belief, in some districts, that it is natural to lose teeth with the arrival of the babies. If there was ever a time when the mother needs strength it is when the baby comes, and that strength cannot possibly be present when needed unless care has been given to the fundamentals, and one of the most important of course, is the care of the mouth.



# Diagnosis and Treatment of Root Canals\*

BY EDGAR D. COOLIDGE, D.D.S.

MUCH importance should be placed upon the diagnosis in every case. Where a vital pulp is to be removed, a radiograph should be taken to reveal the condition, number, size and direction of the root or roots. I believe that where a root is very crooked or constricted, or gives evidence by radiograph of uncertainty in the result the pulp should be retained if there is any possibility of retaining it.

In the interpretation of radiographs of teeth having periapical involvement there are many difficulties to contend with, such as determining the exact extent of an area of absorbed bone, which interpretation is based on the shadow cast upon the film. There is more or less difficulty in some cases in correctly determining whether such an area is partly caused by the normal bone canals and foramina or whether it is entirely pathologic; and again, it is possible to overlook such an area where a very heavy plate of bone exists on both labial and lingual sides, even though the softer cancelous bone between these two plates may be absorbed away to some extent. There is very little doubt that some of these conditions are overlooked. Again there may be definite evidence in the radiograph of an area or cavity, and the tooth over which such is found may contain a vital pulp. It is extremely difficult in some cases to follow the course of a sinus through the bone from its source, and the radiograph may appear deceiving and may confuse one's diagnosis. Clinical evidence is quite essential to correctly locate these conditions and to find the diseased tooth. It is of great value in the diagnosis if it can be determined whether a cavity in the region surrounding a root envelopes or lies back of it or in front of it, and whether there is much of the peridental tissue lost, denuding the cementum. This is of considerable importance in the prognosis of the case, and I believe the explanation of why a cure can be effected in one case and not in another which looks very much the same in the radiograph, is because in one the cementum is actually denuded and infected, and only appears to be so in the other.

A similar situation is seen in the treatment of certain cases of suppurative pericementitis, where a pocket, or seemingly detached tissue, appears to become reattached after treatment contrary to the known principles in regard to reattachment to denuded and pus infected cementum.

Another valuable point in the diagnosis is the determining from the radiograph whether an infection has been walled off by the na-

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\*Abstract from a paper read before the New York Second District Dental Society and printed in the July Dental Items of Interest.



tural defenses of the body, or whether the condition is still developing. It is also valuable in the consideration of a case to observe whether the area has a definite line of demarcation from the healthy tissue or whether it gradually fades away until it is lost in the shadow of the healthy bone. It is impossible to determine the relative danger of systemic infection from these various conditions, but there is little doubt of the presence of streptococci in almost every one, and every one contains other forms of micro-organisms.

The limitations of radiographic diagnosis should always be considered and a careful survey of the clinical evidence should be an important factor in determining the condition and prognosis of each case.

In discussing the treatment of these cases, I do not wish to convey the impression that there is only one method by which successful results can be obtained, but I desire to give the result of my own observation and experience.

In the treatment of clean cases the best opportunity for success is offered and the case should be handled with the greatest care and skill to thoroughly remove the organic matter without destruction of the periapical tissue. In the process of pulp removal the safest method to follow in desensitizing is local anesthesia by novocain, because I believe the usefulness of novocain or cocain in pressure anesthesia has not become ancient history; neither do I think that the devitalization method by the use of arsenic should be relegated to the past. When arsenic is to be used, it should always be kept in mind that the vitality of the pericemental tissue is endangered by too long an application, and it should only be used as an obtunding or desensitizing agent to enable subsequent exposure of the pulp and its removal by novocain or cocain.

After desensitizing and a complete exposure of the pulp, by which I mean the gaining of sufficient access to see the mouth of each canal and to eliminate every curve encountered that is possible to eliminate by cutting away the crown with a bur, one is confronted with the entering and cleaning of the canals to the foramina without making obstructions which prevent a successful operation. The one principle that has given the greatest success in my operations in canals is to carefully *insert the broach to the apical foramen first and continue* the enlarging and cleaning *from that point out* by a process of filing, curettment and raking with the graded sizes of broaches, always carrying on an up and down movement and never a turning or twisting more than a half revolution in one direction, and back the other way the same distance. There are several difficulties usually encountered, among which are the packing of debris and pulp tissue ahead of the broach, but this can be avoided if care is used. Another difficulty is in losing the canal after working for a time. This can usually be avoided if the broach



is selected each time which will readily pass to the apical foramen.

The use of strong alkalis and acids are very dangerous, although there is little chance of mechanically removing all the organic matter from all the branches of canals similar to those shown in the illustrations of teeth by Dr. Callahan. At the same time I think the danger of injury to the periapical tissue is so great when a persistent effort is made to remove this by chemical means that it over-balances the benefit derived in a large number of cases. There must be some means found of eradicating this inaccessible tissue or compensating for it with means that are nondestructive to the vital tissue at the apex, before we shall have completely solved the problem of root canal treatment. That there is a large percentage of teeth having the multi-canalculated and multiple foraminated roots I am convinced, but I am not willing to admit that these can all be cleaned and filled thoroughly and completely by any present method of operation published to-day, without injury to the periapical tissue. I do maintain that if this class of cases is treated and filled by means which do not injure the periapical tissue and if they show radiographic evidence of being filled completely to the main foramina without excess, that we have done the best that can be done at the present time, and the prospect of future infection and pathologic disturbance about the apices of teeth so treated, is very remote.

In treating infected canals where there is no visible destruction of tissue about the periapical region, we are confronted with the difficulty of disinfecting the root without involving the soft tissue either by means of the infection or the disinfectant used. This group contains the teeth with dead pulps and those where previous imperfect operations have been performed. One of the most unfortunate things encountered with these teeth is the partial canal filling of cement. It is extremely difficult and hazardous to remove a cement filling from a root canal. Frequently pieces of metal are encountered also, which are very troublesome and sometimes impossible to remove.

The antiseptics which may be used in treating these roots without danger to the periapical tissue are limited. The greatest factor in cleaning these canals is the mechanical filing and curetting done in the process of enlargement. All strong chemical agents introduce danger to the surrounding tissue. The destructive action of formaldehyd has become recognized and it is generally accepted that it should never be allowed to come in contact with healthy tissue. This principle precludes the use of this agent in more than the first or second treatment of these cases, when a sufficient amount of decomposed tissue remains near the foramen to prevent the escape of this penetrating and irritating gas. The acid and alkali treatment is safe to within a short distance of the foramen, but here again great danger enters when these destructive agents are used. It seems that the



only safe method lies with nondestructive agents supplemented by a thorough curettment.

The possibilities of ionization of a sodium chloride solution in the root canal is worthy of consideration, though it has not gained a general popularity. By means of this treatment it is claimed that the dentin can be disinfected for a depth of one millimeter, without danger to the surrounding tissue, and if this is used just previous to the filling of the canal, it is doubtless a valuable asset in freeing the canal from infection. The experience I have thus far gained in carrying on bacteriologic tests in infected cases by means of medication and by ionization, does not show any great advantage in the use of ionization, but the results of further investigation now under way may be different.

The treatment of canals with periapical infection and bone absorption is very similar to that just described. There are as great responsibilities upon us here in the determination of the advisability of extraction before a long, uncomfortable and expensive treatment is given, as in the matter of the treatment involved. It is possible to see regenerated tissue fill in these rarified areas after treatment and filling, but a picture of such a condition does not prove the absence of infection. There are certain conditions where extraction is positively indicated and these can largely be determined by the extent of denuded cementum of the root shown in the radiograph. Where a denuded root end projects into an open cavity there is little chance for a cure by medication. Root resection or extraction is indicated.

Any case showing positive destruction of the peridental membrane, denuding an appreciable area of cementum should be looked upon as serious, and so should an area showing a clear-cut outline between the healthy and the diseased tissue. Areas with no definite outline may have liquified tissue extending in radiating directions from the apex of the root and many spicules of diseased bone remain which can not be removed in any way but by extraction or curettment. Pus and micro-organisms are always found in these cavities and I have not always been able to free them from these conditions by medication or ionization, and I believe many that have been considered as cured in the past, would give positive evidence of infection and pus at the apex if opened to-day, even though the radiograph may seem to show a regenerated tissue.

Every tooth which can be freed from pus and infectious material and which can be retained with safety to the health of the patient should be saved, but where there is much doubt as to the permanence of such a cure on account of denuded cementum, it is better to advise extraction instead of treatment. There are other conditions which prevent a successful operation, such as obstructions which can not be overcome in root canal treatment and filling, which the operator should be keen enough to recognize at the beginning, and the



patient advised as to the doubtful outcome of the operation, for justice is due to both patient and operator.

Much has been left out of this discussion in regard to details of treatment which are of the greatest importance to a successful operation. The question of asepsis and sterilization has been entirely omitted, but I wish to record one statement which perhaps will convey the idea without detailed description. Surgical cleanliness and asepsis is the motto, with no dressing, instrument or material unfit for any surgical work. I wish here to pay tribute to the valuable contribution to the methods of asepsis and sterilization which have been suggested by Buckley, Best, Rheim, Ottolengui and Callahan.

The question of a successful root canal operation is largely solved when the canal is ready to be filled, and yet there remains ample opportunity for failure or unfortunate results. A canal filling which is incomplete can be removed and another attempt made, while an excess of material can only be removed by surgical means or left in the tissue. Only the canal filled to the apex and not beyond can be looked upon as perfect, although in certain cases it may be desirable to have a slight protrusion of the fluid portion of the filling. It is my desire in this work to allow only a sufficient amount of the fluid, which is chloro-percha, to pass beyond the foramen to give evidence by radiograph of completeness. In canals having large foramina it is impossible to regulate the excess unless a definite amount of material is used, and the less fluid material is used the less uncertainty will be encountered.

When the canal is ready for filling, the No. 34 S. S. White or No. 1 Kerr root canal plugger will pass to within two millimeters of the foramen of the canal, which has previously been thoroughly cleaned and measured by the measurement wire radiographed in position in the root. After thoroughly dehydrating the canal it is moistened with eucalyptol and followed by a single drop of chloro-percha carried to the apex. A piece of gutta-percha core is cut one millimeter more than long enough to equal the length of the canal when placed upon the end of the No. 34 canal plugger, and of a size in diameter great enough not to pass through the foramen. When this is inserted and packed into the canal previously moistened with eucalyptol and a drop of thin chloro-percha, the space beyond the plugger about two millimeters in length, into which is packed the piece of gutta-percha three millimeters long, with a liquid chloro-percha to be forced in front and laterally, the chance of having too great an excess is reduced to the minimum, while there is frequently found by radiograph evidence that two or more branches of the main canal are filled at the same time. The canal is filled by packing small pieces in the same manner, one by one, until finished.

Small canals should be enlarged to insure proper filling and their filling then becomes a repetition of the same process as used in large



canals. Where the apical foramen can not be passed by a broach, the method of dissolving cone after cone with the pumping motion in the canal, in a thin solution kept thin while the pumping is continued and afterward packed down by pluggers, carrying short pieces of gutta-percha cones, is recommended.

In conclusion may I call attention once more to the all-important, but, I am sorry to add, often neglected feature of root canal operations, which is surgical cleanliness, of a practical nature, which can be used by every operator. The use of destructive agents should be attended with the greatest care to preserve the health of the periapical tissue. A careful diagnosis and prognosis should be made of every case and the patient instructed accordingly, to do justice to the patient and to protect the operator from criticism when all that human hands can do with present methods of operating does not give a perfect result. Accurate measurements should be made of length, size and diameter of foramen of every canal before filling, and the operator should limit the uncertainty in filling as much as possible by the use of these measurements and the control of his filling material.

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## Hamilton Dental Society

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THE September meeting of the Hamilton Dental Society partook of the form of a complimentary dinner in honor of Lieut.-Col. G. G. Hume, who recently returned from service overseas. There were also present as guests of the Society, Lieut.-Col. W. G. Thompson, A.D.D.S., M.D. No. 2; Major Roberts, Spadina Convalescent Hospital, Toronto, and Major W. E. Cummer.

Major Roberts addressed the meeting upon some interesting phases of hospital work in the Canadian Army Dental Corps, and Major Cummer presented the subject of Indirect Retention in a most practical way.

Lieut.-Col. Hume spoke of many of his experiences in Canada and England. He outlined the activities of the C.A.D.C., overseas, and gave a most interesting description of some of the newer things in war prosthesis, illustrating his remarks by means of lantern slides.

Lieut.-Col. Hume and Major Cummer were presented with very appropriate military canes, while Lieut.-Col. Thompson was the recipient of a tobacco pouch and pipe as a token of the esteem and sincere appreciation of the Hamilton dentists toward the C.A.D.C. and the officer commanding of the Corps in Military District No. 2.

The meeting was voted one of the most pleasant in the history of the Society, and the best of good fellowship prevailed throughout.

Dr. Donald Clark, President of the Society, was in the chair.



# The Value of Proximal Contact\*

BY F. H. ORTEN, D.D.S.

**T**EETH serve to render each other mutual support, so that when a tooth is lost from the arch the approximating teeth tend to work their way into the space left vacant, thus acquiring an abnormal range of movement. Now, in these cases, it has been repeatedly demonstrated that the use of fixed bridgework in order to immobilize these teeth to a certain extent, has served to prolong their life and usefulness for many years.

Assuming for example the simple case of the loss of the first lower molar. There invariably occurs as a consequence, a gradual mesial-lingual tipping of the second and third molars, and a buccal tipping of the opposing teeth. The change is gradual, extending over a period of years. It may be very much slower than the changes forced by orthodontic appliances. In the early stages such a condition presents no indications of pathology, no signs of pyorrhea; and the teeth are not loose, as that term is ordinarily understood. The teeth simply do not have the same support that they formerly had and still need.

One of the simplest methods at our command for the correction of this condition, as well as for the restoration of normal occlusion and articulation, a method which prevents further changes in the arches, in my opinion, is the use of a properly constructed fixed bridge. The comparison with a surgeon's splint is wholly inapplicable, and the two cases are not at all parallel. A surgeon's splint is used to immobilize a tissue temporarily, so as to make more favorable the conditions of repair; a fixed bridge is intended to act as a substitute for lost tissue, and to restore lost function. A properly constructed bridge would not absolutely immobilize the teeth, though it would prevent the teeth used as piers from moving except in unison. My experience is that the majority of fixed bridges have altogether too much, instead of too little, movement. Fixed bridgework as such should not be made responsible for what is merely an ordinary failure to pay attention to certain essential requirements of good dentistry.

I would not have it understood that I am advocating fixed bridgework in general, as opposed to removable bridgework, in general. I am, on the contrary, thoroughly distrustful of all panaceas, by whatever name they are called. I am convinced that fixed bridgework has a limited range of application. Merely to illustrate my position, I will say that I am among the pioneers in the construction of removable bridgework. I have one patient for whom I constructed a removable bridge eighteen years ago, since several times repaired, and still doing good service. I also have several patients for whom I

\* Extracted from "Around the Table" in the Dental Items of Interest for May, 1918.



constructed fixed bridgework in 1898, and two in 1899. Within the last two years I have inspected all these cases, and have found the abutment teeth still firm—I mean that they are as firm as the corresponding teeth on the opposite side of the arch, which have not been immobilized. Considering that I was at that time quite ignorant of essential requirements, and that my experience was limited, the fact that good results were obtained seems to me sufficient justification of my insistence that further proof ought to be presented before the profession can justly be called upon to abandon this apparently valuable method. Nor is my experience in this respect exceptional. It is difficult not to feel that the factor of mobility is being over-emphasized, and the whole problem too much simplified.

Permit me once more to emphasize the changes that take place when a tooth is lost from the arch. There are changes in the opposing teeth, and in the occlusal plane, bringing it out of harmony with the planes of the remaining natural teeth; changes which are so slight as to be frequently overlooked when examining the mouth itself, and which should, therefore, receive special study when examining our models. When these changes, are ignored, and I mean to include even the slightest distortion of the occlusal plane, as well as the dropping or elongation of an opposing tooth; and when the bridge is simply made so as to occlude when the teeth are in contact, then it is inevitable that the articulation should prove to be faulty. In that case, less harm will be caused to the abutment teeth, as well as to the opposing teeth, if both the abutments and the dummies be allowed individual movement—I had almost said, the more movement the better.

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## Preparing Root Canals for Filling\*

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BY W. G. EBERSOLE, D.D.S.

THE first thing to do is to thoroughly open up the pulp chamber, using the utmost caution to avoid destroying the normal walls of the chamber until after successfully locating the opening into each root canal, after which proceed to cut away enough of the tooth substance to give access to the canal in the straight line with its long axis.

This is done by the employment of both chemical and mechanical means. I always use the sodium-potassium alloy as my first chemical or therapeutic agent. This alloy is an alkali with powerful oxidizing and saponifying properties. It has such a great affinity for moisture that if the humidity is very high, combustion takes place before it can be carried from the glass tube to the canals. If it is brought into contact with water or moist tissue it burns with great violence and

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\* Extract from a paper read before the Cleveland Dental Society, which is published in full in the Dental Summary for April.



gives off intense heat. It is the quickest-acting and most reliable root-canal sterilizing agent of which I have any knowledge.

The alloy comes in very small tubes, and must be handled with the utmost care to avoid deterioration in the tube from faulty sealing after using. The alloy is carried direct from the tube to the mouth of each canal by the use of a small twist broach, and carefully worked into the canal. Care must be employed to have the pulp chamber dry before attempting to use the alloy. The chemical action which takes place in the canals soon produces quite a little moisture. Do not attempt to dry the canal until after you have made a number of applications of the alloy and then you safely may remove the excess moisture which the chemical activity has produced.

After carrying the agent into the canal for some distance and waiting for a few moments, you may begin your exploration of the canal, using what I am pleased to call a Pathfinder, which is a very fine, smooth broach. This is used with a careful pushing and picking motion. If the broach is stopped, remove and curve the end a little and then insert and by a careful twisting motion you will, in most instances, be able to pass the obstruction and reach the apical foramen. Following this opening to the apex, wipe out any excess moisture with a few fibres of cotton on a broach and again apply the sodium-potassium alloy. Make sure that you carry it well down toward the apex, but not through into the apical space; then let the case rest a few moments while the agent either oxidizes or saponifies all organic matter within its reach, both in the canal and the tubuli. It is my belief that this agent is far more effective in both the root canal and the dental tubuli than any other agent that we can employ. After a wait of a few moments I wash out all the saponified matter. For this purpose sterilized water may be used.

Normal saline solution and Dakin solution have been recommended, but the objection to them in root-canal therapy is the film of salts that they deposit on the walls of the canals. In my practice I use pyrozone as my cleansing and washing agent instead of sterilized water, because of its greater cleansing properties. I continue the washing processes until signs of stain disappear from the cotton fibres or the paper points which are used as a vehicle to carry and remove the cleansing agent. I then dry the canal, using paper canal points to remove the moisture. The canal then is flooded with sulphuric acid C.P. (chemically pure), using an old pair of pliers to carry it to the canal and then using a fine, smooth broach to pump it well down to the apical end. The acid is permitted to remain for a few moments, that it may enter the dental tubules as far as possible. In fact, I carry new acid into canal several times within the next few moments; then it is neutralized by a sterilized solution of sodium bicarbonate, using enough of the solution, pumping it well into the canal and given plenty of time. I use the full strength acid because



of its high affinity for moisture and because of the greater violence of its chemical activity when neutralizing it, for I am using acid in this instance not for the purpose of enlarging the canal, but for two other purposes. First, to neutralize any of the sodium and potassium that remains unsatisfied; second, for the mechanical action of the gas formed during the chemical process, in emptying the dental tubules of any saponified organic matter that has not been removed by previous treatment.

Remember that I am not using the strong acid for its dissolving or softening action on the inorganic tooth substance, but chiefly for the purpose of assisting in emptying the dental tubules of any remaining organic matter that they may better be prepared for the reception of my filling materials. Following the use of the sodium-bicarbonate I carefully remove all traces of it, using pyrozone for this purpose. The canal is then dried, using alcohol and paper canal-drying points.

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### More Honors for Canadian Dentists

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**L**IEUT.-COL. F. T. COGHLAN, D.S.O., Officer Commanding 9th Canadian Artillery Brigade, British Expeditionary Force, France, has been awarded the Croix de Guerre.

Captain Wm. Thos. Hackett, C.A.D.C., has been mentioned for "valuable services."

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### Advisory Committee on Cases of Alleged Malpractice

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**T**HIS committee has been organized by the Ontario Dental Society for the purpose of advising members of the profession who have been threatened with legal proceedings for alleged malpractice.

At the last meeting of the Ontario Society the original committee was re-appointed, and is composed of Drs. F. J. Conboy, A. E. Webster, Wallace Seccombe, and R. G. McLaughlin. Any member of the profession who wishes to consult this committee should address the chairman, R. G. McLaughlin, 54 College Street, Toronto.

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**VINEGAR FOR SOFTENING PLASTER OF PARIS.**—Vinegar, having the property of disintegrating plaster, may be employed in the laboratory for removing plaster from flasks, by immersing for few seconds only; for removing casts from articulator by applying over bows only; cleaning impression trays, etc.—*Lester N. Roubert, Dental Review.*



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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, OCTOBER, 1918

No. 10

## EDITORIAL

### Forward Step in Ontario Dental Standards

**A**N advance step in dental educational standards in the Province of Ontario, was taken at the Royal College of Dental Surgeons this session, in requiring that all Freshman students attain full dental matriculation before enrollment. Heretofore, it has been possible for students to register in the first year with a departmental partial matriculation certificate, upon condition that the complete college matriculation requirement be met before entering the second year.

Experience has shown that students entering the dental course and carrying conditions in preliminary work, are under a serious handicap, their attention being constantly diverted from the studies in hand. In other cases students find it irksome to remove the conditions and defer, from time to time, the completion of the remaining subjects until force of circumstances makes further delay quite impossible. These difficulties will entirely disappear under the new plan whereby students must meet the complete entrance requirements before registration. To justifiably raise dental college standards is to raise the status of dentistry and to raise the status of dentistry is to render better service to the public.



## A Shake-Up in the C.A.D.C.

THE dental profession received something of a "jolt" when it learned that five of the Assistant Directors of Dental Service in Canada had been ordered to proceed overseas with the rank of captain. When one considers the important work of these officers in Canada, and that three have held the rank of lieutenant-colonel and two that of major, the above action appears to be rather drastic. If some of these officers expressed a desire to go overseas, surely their past services should have been recognized by sending them with rank.

We would be very glad to learn that these officers are to take charge of dental centres in England, while corresponding officers in England are to be returned to Canada for the purpose of bringing about closer co-operation between the two services. However, the absence of any announcement to that effect, the lack of cordial co-operation between the Directors of Dental Service in Ottawa and London, and the dispatch of these officers with rank of captain, combine to make this suggestion appear rather improbable.

The profession naturally wonders why these changes are of so sweeping a character and carried out in such a peremptory way. In seeking an answer almost the first thought that suggests itself to the lay mind is that of inefficiency. There certainly appears to be a lack of efficiency somewhere; but that these particular five points were the weak spots, is not accepted without the greatest reserve by those familiar with the work of the Dental Corps in Canada. As a matter of fact, it is generally recognized that it has been the district officers and their commands, who have really made the corps in Canada what it is, through the high quality of dental service rendered the individual soldier.

Certain it is, if the question of inefficiency does not enter, grave injustice has been done these officers in so dealing with them without a word of explanation or information as to their disposition upon arrival in England. This procedure may be quite correct in a strict military sense, but in dealing with dental and medical officers the militia should bear in mind, that they occupy somewhat the position of trustee of these officers' reputations as professional men. A dentist's reputation as a practitioner, may be greatly enhanced or seriously damaged by his place and work in army service, and his reputation is one of the most important civil assets he possesses. These five district officers certainly should not have been given so little consideration, unless perchance, there had, upon their part, been gross negligence or inattention to duty.

If this shake-up indicates inefficiency in the Dental Corps, where is the trouble? Is it at the top or the bottom? To be perfectly frank, dentists generally have about come to the conclusion that the trouble is not at the bottom and the authorities would be well advised, in the best interests of the dental services, to recognize the fact.



## C. N. Johnson Bereaved

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THE dental profession will sincerely regret to learn of the demise of Mrs. C. N. Johnson, of Chicago. Though Mrs. Johnson has suffered ill health for some years past, her condition was not considered to be really serious until but comparatively recent date.

Dentists everywhere have learned to love and respect Dr. and Mrs. C. N. Johnson, and all will feel a very keen sense of personal loss in the passing of Mrs. Johnson. Dr. Johnson and the other members of his family are assured of the sincerest sympathy of a host of friends throughout the dental profession—and from none more than from their many Canadian friends.

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## Six Freshettes at the Royal College

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AN interesting fact regarding this year's R. C. D. S. Freshman Class is that no less than six Freshettes have been enrolled for the study of dentistry. The largest number of women registrants in any previous year was three.

In the Province of Ontario the consensus of opinion among dentists is, that to *encourage young women to enter the regular dental course* is immeasurably better than to specially train "dental hygienists" in an abbreviated course, to perform operations in the mouth, that only graduate dentists are properly qualified to perform.

An efficient system of school dental service, embracing both the rural and urban schools throughout the Province of Ontario, is certainly "on the way" and the Royal College, the profession, and the public, are to be congratulated upon the enrollment of these six young ladies as undergraduates in dentistry. These young women and those who have registered at other dental colleges are undoubtedly preparing themselves for important public health service in the years to come.

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## Dr. F. S. Lodge, Deceased

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THE profession will learn with regret of the death at Charlottetown, P.E.I., on October 12th, 1918, of F. S. Lodge, D.D.S., in the thirty-eighth year of his age. He was a graduate of Baltimore Dental College class of 1903. The late Dr. Lodge was fifteen years in the practice of his profession in Charlottetown.





## *Saved From Ourselves*

ONE of the very great advantages of being busy and tremendously in earnest over the worth-while tasks and enterprises of life is that, when we are thus engaged, we haven't too much time and thought to give to ourselves. When we come to sift it to the bottom it is the man who hasn't much to do, or who isn't devoting himself to what he has to do with anything like enthusiasm, who has the time and the mind to give to those most wearisome and afflicting occupations, nursing imagined wrongs and grieving over fancied troubles and tribulations. The man who is up and at the job . . . cannot very well be conceitedly moping around lamenting his afflictions or worrying over the failure of the world to appreciate all his gifts and graces. And to be thus saved from oneself, that is, from one's little, mean, narrow, selfish self, is to be saved from some of the most wearying and bothersome afflictions that life can have.—*The Guardian*.





ARTHUR E. SMITH, D. D. S., M. D.,  
*Chicago.*



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, NOVEMBER, 1918

No. 11

## Nerve Blocking

BY ARTHUR E. SMITH, D.D.S., M.D., CHICAGO, ILL.

*(ORAL HEALTH is indebted to Dr. C. N. Johnson and the Dental Review for courtesy of publication of Dr. Smith's paper and generously loaning electrotypes for purpose of illustration.—Editor.)*

IT gives me a great deal of pleasure to accept your kind invitation to speak to you this evening, and especially upon a subject which is so broad and of such vital interest not only from the dentist's but the patient's standpoint.

I am a staunch believer and dyed-in-the-wool follower of the methods that eliminate pain from operations. The question of anesthesia is of great magnitude and vital importance to our profession. The careless administration of both local and general anesthetics should be discontinued. Carelessness in the administration of these anesthetics is usually practiced by the dentists having limited knowledge of the physiologic and toxic effect of the agents used.

It is impossible for me in one evening to properly unveil to you this broad subject. I must pass on and try to give you a few of the essential facts.

The word "Anesthesia," meaning "without sensation," was suggested to Dr. Morton by Oliver Wendell Holmes. Anesthesia is a state of insensibility or a state of the loss of sensation produced by artificial means. General anesthesia is covered by this definition but does not cover local anesthesia for the reason that in local anesthesia the sense of touch remains.

There are two ways of producing anesthesia:

First—By rendering the sensory nerve cells and fibres in the brain insensible to pain by general anesthesia.



Second—By blocking the nerve branches at some point after they leave the brain, or by blocking the peripheral nerve endings with a local anesthetic. Local anesthesia may be produced by two methods, First, by inhibiting the function of the terminal endings of the peripheral nerves. This renders these terminal nerves within a “circumscribed area” incapable of transmitting painful afferent impulses and is termed “Terminal Anesthesia.” Second, by blocking the



FIG. 1.

This wet anatomical specimen shows head that has been sectioned seven times in order that the relationship of the anatomical structures can be studied.

nerve trunk or trunks at some distant point from the field of operation, the point determined upon may be at any desirable location between the peripheral nerve endings and the brain. This is known as “nerve blocking.” However, some operators term this “conductive anesthesia.”

Nerve blocking anesthesia may be produced by two methods:

First—Perineural.

Second—Endoneural methods.



In the perineural injections the solution is injected into the tissue near the nerve trunk and the anesthetic solution infiltrates through the perineurium which anesthetizes the neurones.

In the endoneural method, the needle should pierce the nerve sheath and the solution be injected into the nerve trunk proper. This latter method is of very little value and is used only in some cases of major surgery, and it is necessary to make the incision and expose some large nerve trunk and insert the needle into the nerve

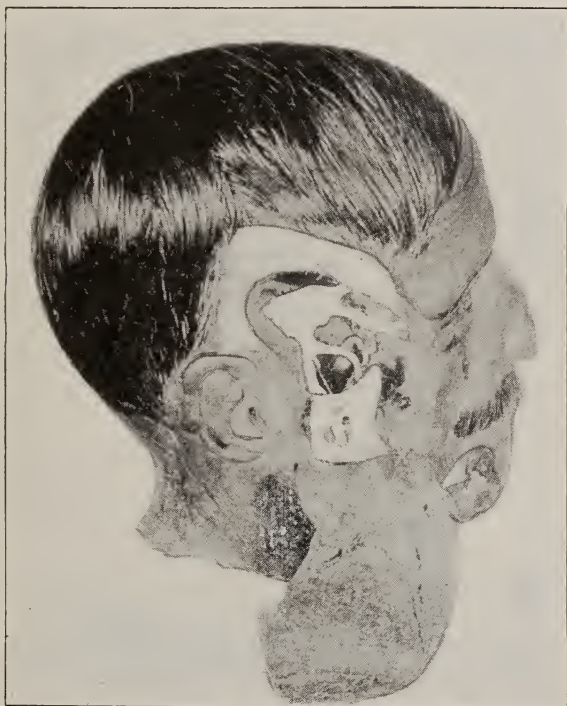


FIG. 2.

Shows specimen which has been carefully prepared in order to show Gasserion Ganglion and the fifth nerve in detail as well as important arteries and other anatomical structures.

at some point above the area of operation, say if the operation is for the removal of a leg or arm, etc.

The perineural method is preferable, however, the same requires a few minutes longer to produce complete anesthesia of the axones. No doubt, the perineural method is better than the endoneural method of puncturing the nerve trunk. It is rather difficult to ascertain whether or not the point of the needle is inserted in the nerve trunk during nerve blocking injections as are given for dental and oral



surgery. I have never experienced the slightest difficulty in this respect from neuritis or prolonged anesthesia.

The specialist or practitioner taking up the various forms of anesthesia and more especially nerve blocking, must appreciate that it involves many important details and each step is a well defined and separate feature, and that neglect or oversight in any of the details may produce unsatisfactory results.

The following should be established in order to obtain the best results.

First—Strict adherence to asepsis.

Second—A true knowledge of the anatomical parts.

Third—Carefully selected equipment.

Fourth—The use of an isotonic anesthetic solution composed of ingredients corresponding to the physical laws of osmotic pressure and functions of the living cells.

Fifth—Thorough familiarity with all phases of the technique.

Sixth—Judicious selection of the correct method to be employed in each individual case.

Seventh—Diagnosis of any and all existing conditions.

Local and general anesthesia in their various forms are invaluable in oral surgery and modern dental practice and it behooves the dentist to familiarize himself with those agents and methods for the purpose of eliminating pain if he expects to keep pace with the modern trend.

I am quite aware of the fact that it is not necessary to use a local or general anesthetic in every case, but I am a firm believer in some pain relieving agent in those cases in which it is indicated, and I am quite sure the patients upon whom they are employed to have an operation performed, will speak words of praise and gratitude for the dentist who renders them such service. We must view the subject of anesthesia from a broad standpoint, and it is self evident when this important subject is handled with this aim in view, that the members of the profession will profit much more than would be rendered to one particular phase of anesthesia. One of the foremost subjects to-day in both dental and medical science is that of anesthetics. It is gratifying to go back over the records and note the advancement that has been made, and the most rapid advancement has been during the past twenty-five years, and it has evolved itself into a distinct science. Various methods and agents have been introduced as a means of annulling the pain of surgical and dental operations, and all these agents no doubt have some merit but some are superior to others. Whatever method or methods one undertakes to employ, it must be pursued with diligent and persistent effort to become proficient in its use. There are two methods which stand supreme to-day, one being local anesthesia, under which are many divisions and sub-divisions such as nerve blocking, intra-osseous,



and terminal anesthesia; and the other is general anesthesia, and here we mention nitrous oxid and oxygen as the most efficient anesthetic aid known in the hands of the experienced and a dangerous anesthetic in the hands of the novice, for prolonged surgical operations. Nitrous oxid and oxygen stand supreme as a general anesthetic when it is administered by one skilled in its use, and the pathological effects upon the patient are practically nil. It is a point not

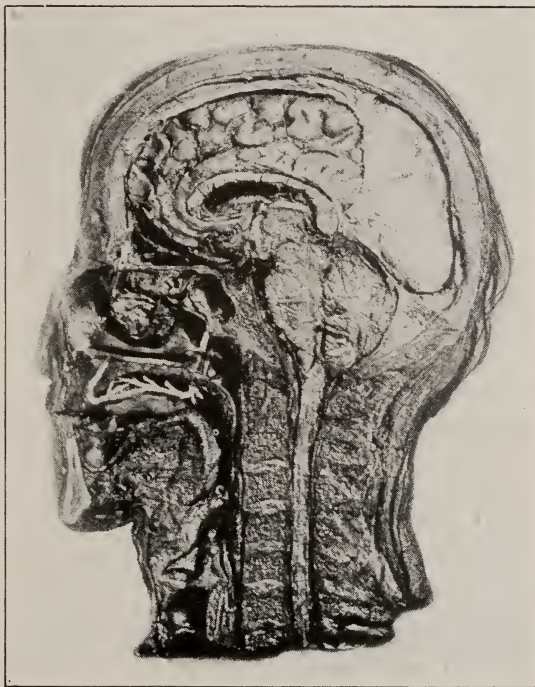


FIG. 3.

Above wet specimen was sectioned through the median line. Note the inner nerve loop which is formed by the naso-palatine and anterior palatine nerves. The anterior palatine nerve is exposed in posterior part of middle meatus. A portion of tissue was removed from beneath the frontal lobes of the brain due to the presence of a tumor which can be seen in the nasal cavity. The circle represents the outline of tissue which was located above the ethmoid bone.

to be argued that nerve blocking in all its phases, when skillfully employed is of greater value to the dental and oral surgeon than is general anesthesia. General anesthesia has its place in dentistry and has its indications and contra-indications in certain individuals, which is also true for nerve blocking. In a high percentage of cases for operative dentistry and oral surgery, nerve blocking in some of its phases is preferable to general anesthesia. Nerve block-



ing is adapted to those parts where the nerve trunks are readily reached by the needle. The key note to success is to practice asepsis, a thorough knowledge of anatomy, and to deposit the solution near the nerve trunk supplying the area of operation—then it is imperative to have an accurate knowledge of the muscles and attachments, osteology, nerves, blood vessels and their anastomoses and other anatomical structures.

When one masters the technique of nerve blocking any or all parts of the jaws or any other regions of the head can be easily blocked; the patient being conscious can prevent the inspiration of mucous or blood and thus assist the operator with the operation. Nerve blocking is used with great satisfaction in oral surgery and operative dentistry for exodontia, removal of certain tumors, reduction of fractures, antrum operations, treatment of tic douloureux, apicoectomy, alveolotomy, pulp removal, cavity preparation, peridontia and crown and bridge operations.

By no means is nerve blocking limited to surgery of the head, but is being employed by many surgeons with satisfaction for the following operations: Hernia, appendicitis, empyemia, gastrostomy, tracheotomy, goiter, rib resection, inguinal colostomy, various amputations, varicocele, hydrocele, circumcision, ligation of arteries, removal of subcutaneous tumors and other general surgical operations.

The impacted third molar can be removed under nerve blocking with the co-operation of the patient and anesthesia will last in accordance with the amount of the vaso-constricting agent used in the injecting solution (five minutes to two hours) thus giving ample time for this or any other operation with a minimum amount of laceration. Complete apposition of the bones in case of fracture can be secured and plints can be adjusted with the co-operation of the patient and with absence of pain.

#### REACHING THE GOAL OF A SHOCKLESS OPERATION.

It is the aim of every modern surgeon to employ technique which produces the least amount of shock to his patient, and within recent years more and more attention is being paid to the anesthetic and the capability of the anesthetist. It is quite true that in years gone by the little attention given the anesthetic agent employed, and the haphazard manner in which it was administered, caused the surgeon a great deal of grief with many of his cases; but now the anesthetist and surgeon can in many cases predict the outcome of the case after a thorough physical examination.

In years gone by it was the custom to select only one general anesthetic in surgery, but modern research has proved that in order to attain the desired goal of a shockless operation it is far better to select a combination of methods, and follow a definite technique in order to reach the highest ideal. We must acknowledge as a fact



that the dental practitioner is confronted many times with operations which cause pain and this factor has acted as a stumbling block in rendering the best service, and does in many instances create in the mind of the patient a horror of the treatment that is so necessary for the proper maintenance of health. In this day and age of anesthetics there is no more reason why a dentist should inflict pain while rendering service than a surgeon in amputating a leg. However, it is not in all cases the amount of pain really inflicted that causes emotional shock or collapse, but in many such results can be attributed to the fear of being hurt. The clinical and laboratory research on shockless operations, accomplished by Dr. Crile, of



FIG. 4.

This specimen has been prepared in order to show important structures for oral surgery operations. The inferior dental and lingual nerves can be seen.

Cleveland, is really a revelation, and his clinical records prove the value of well selected methods. He says: "The word anesthesia—meaning 'without feeling'—describes accurately the effect of inhalation anesthetics. Although no pain is felt in operations under inhalation anesthesia, the nerve impulses, set up by surgical operations, reach the brain. These are the afferent impulses which cause pathological brain changes. In this manner traumatic shock is caused. How can we prevent it? On the kinetic theory, no shock could be produced by traumatizing a territory whose nerve connection with the brain has been broken by nerve blocking. By blocking nerve connections, local anesthetics protect the brain against destructive stimulation of the brain cells. Each anesthetic covers a



part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. The patient's fear of the operating room, unsoothing words, and the dread of the operation and the taking of an anesthetic, the rough manipulation of the tissues during the operation, and the ungentle post-operative manipulation, all these things generate harmful stimuli which are sent to the brain and cause detrimental effects, the stored up energy in the normal brain cells being destroyed."

These harmful stimuli, which in the past have played an important role in causing a high mortality rate, are now blocked by the anoci-association method and in consequence there is a decrease in the mortality rate to an extent one can hardly believe. This new principle excludes all harmful stimuli reaching the brain and the bad risk patient has a greater chance to live than the patient who is operated without the blocking of these impulses. This is accomplished in modern surgery as follows:

- (1) By exclusion of fear and dread of the operation.
- (2) By the administration of morphine and scopolamin one hour before the operation.
- (3) By the scientific administration of N O & O.
- (4) By nerve blocking.
- (5) Careful post-operative treatment.

Dr. Crile also makes the following statement: "No matter how extensive the operation, no matter how sick the patient, no matter what part is involved, if anoci technique is perfectly carried out the pulse rate at the end of the operation is the same as at the beginning, and the post-operative rise of temperature, the acceleration of respiration, the pain, the nausea, and the distention are minimized or wholly prevented." Is it not just as important that the dental practitioner should endeavor to eliminate detrimental factors from his operations as for the modern surgeon? It is true that the operations performed by the dentist are not so grave in character as those of general surgery, yet they are just as important, and the patient appreciates the accomplishment of dental service free from pain. How is it possible to avoid the dread, the fear, and the pain caused by dental operations? It can be accomplished through the medium and proper application of proper pre-operative environment; a preliminary sedative if necessary: Procaine-Suprarenin-Ringer solution; Nitrous Oxid-Oxygen; careful operative procedures; proper application of psycho-therapy and efficient post-operative treatment.

#### NERVE BLOCKING IN ORAL SURGERY.

This important branch of anesthesia has made such rapid strides within the last two years it has attracted the attention of the oral surgeon as well as the general practitioner of dentistry, and in many operations the oral surgeon is now able to obtain results heretofore unattainable through the medium of general anesthesia. It



is a well-known fact that many times the oral surgeon is handicapped while operating for various pathological conditions of the jaws or within the oral cavity when a general anesthetic is employed.

The head and neck offer an available field for operations under nerve blocking. This is especially true of operations involving the face and jaws from the very fact of the constant location and susceptibility of the nerve trunks supplying these parts. The modern trend has been in the direction of blocking the deep nerve trunks and this technique has made possible many major operations which were heretofore performed only under a general anesthetic. It goes with-

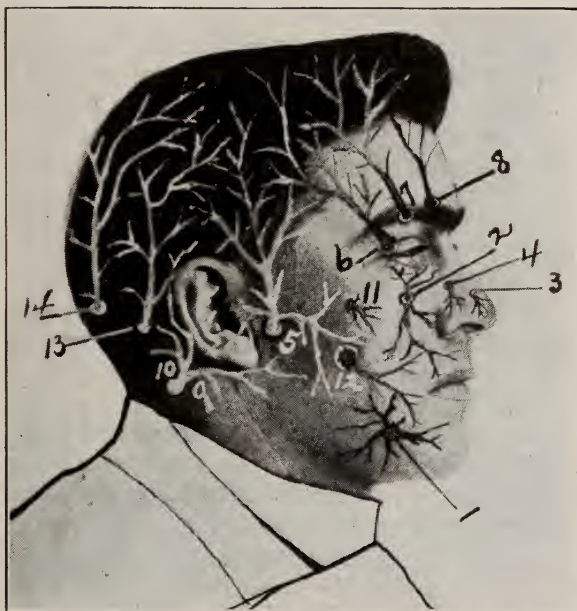


FIG. 5.

This photo shows the sensory nerves supplying the face which branches can be blocked for oral and plastic surgical operations.

out saying that nerve blocking should only be employed in cases where it is possible to completely block the operated area and render it insensible to pain.

Nerve blocking is technical and demands skillful technic in its employment in order to attain satisfactory results for both the operator and the patient. Considerable skill is required in making deep nerve-blocking injections, and every one must expect failures at the beginning.

The operator should blame failure to the technique used and should search diligently for the cause of failure to render the parts



insensible to pain. The trained anesthetist can make a most valuable use of psycho-therapy in addition to his general anesthetic, and this is of exceptional value to the operator employing local anesthesia in its different branches. The imperfection of the technic often leads the operator to persuade his patient and he himself labors under the delusion that no pain is experienced. When the operation is upon a patient, who is hysterical and of nervous temperament, and anticipation and fear of pain are added to the adverse conditions which go to make up the failure, the patient may actually cry out and manifest a high degree of excitement during the operation and afterward tell the operator that she felt no pain. This type of patient should never be given a local anesthetic, but a general anesthetic should be employed, because the dread of the operation and the fear of being hurt is as wearing upon the nervous system as is the actual pain. In every case requiring an anesthetic we should use our best judgment in deciding which to use—a local or a general anesthetic. The nature of the operation and the physical condition of the patient should both be taken into consideration in the selection of the anesthetic. The anesthetist must not be hasty in his decision.

Extremely gratifying results are obtained from nerve blocking when the technique is properly executed. It is not possible to secure one hundred per cent success in all cases, neither can we secure this result with the use of nitrous-oxide-oxygen, ether, chloroform, or any other anesthetic agents. The skilled and experienced anesthetist never realizes a complete success in each and every case, with any anesthetic, but it is evident that we can obtain better and more gratifying results through the careful selection of the anesthetic agent or agents most adaptable to each case.

#### ANATOMY.

The latest key note to success with nerve blocking is for the operator to have a thorough knowledge of the anatomical parts. This is absolutely imperative if the operator expects to make the deep nerve blocking injections in an intelligent manner, because we will all agree that to insert a needle into the deep tissues at random and not knowing the exact location of the various nerve branches to be blocked, would result in failure many times. When the operator is familiar with his anatomy, knowing the exact position of all anatomical structures, and their relationship to each other, the needle can be inserted with more accuracy and in most cases we can predict the outcome will be a success.

It is impossible for me this evening to discuss the anatomy that is so necessary for the operator to know, therefore I refer you to any standard textbook and the dissecting room.

#### ANATOMICAL SPECIMENS.

Too much emphasis cannot be placed upon the value of prop-



## ORAL HEALTH

erly prepared wet anatomical specimens for those operators who are desirous of becoming familiar with the anatomical structures and their relation to oral and dental surgery and for nerve blocking injections. The student and post-graduate can obtain more practical knowledge from a few hours' conscientious study of carefully prepared specimens or in the preparation of these specimens, than to spend days perusing books on anatomy. It has been my pleasure to prepare a large number of specimens, which have proved of immeasurable value in the execution of my work, and to members of the profession who have studied them in study clubs. These specimens were carefully prepared and surgically embalmed, and were

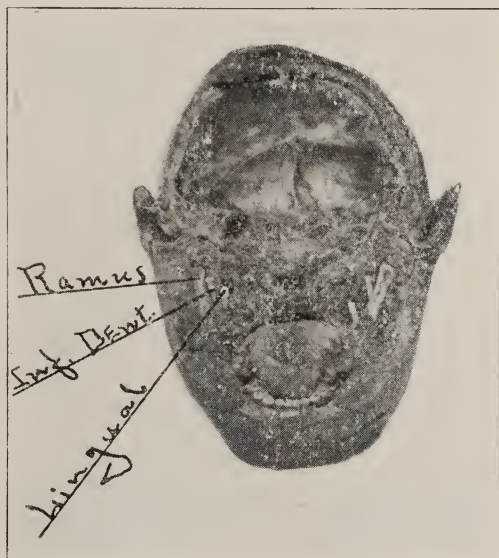


FIG. 6.

Horizontal section of wet anatomical specimen incised at a point 1 cm. above the occlusal plane of the lower teeth. The lingual and inferior dental nerves are fully exposed.

then sectioned at various levels showing the different nerves and branches, ganglia, arteries and veins, and bony landmarks. They show all anatomical landmarks in their relationship to each other which come under the operative field of the oral surgeon as well as the eye, ear, nose and throat specialist. Within the near future, it is my intention to prepare several more specimens and the anatomy of the tonsils, throat, ear, nose, antrum, frontal sinus and mastoid, will be carefully worked out in detail.

I will take pleasure in showing you the photographs of a number of them with the stereopticon this evening. However, I will at this time refer to one specimen in a concise manner.



The head was sectioned through the median line, and an incision made from the external angular process of the frontal bone to a point 3 cm. above the pterion, then to a point anterior to the anti-tragus, extending downward to a point midway between the sigmoid notch and the angle of the mandible. After making this incision a flap of skin and muscle was carefully separated from the periosteum over portions of the following bones, temporal, parietal, sphenoid, maxillary, malar and ramus of the mandible. Portions of these bones were trephined away and portions of the temporal and frontal lobes of the brain removed, exposing the following structures: Gasserian ganglion, posterior, middle, anterior and naso-palatine, inferior dental and lingual nerves, internal maxillary artery and several of its branches. The superficial origin of the fifth cranial nerve is at the side of the pons varolii and is shown connecting with the Gasserian ganglion. The fifth nerve and all its branches are carefully exposed to their termination. The various foramina, such as the infra-orbital, mental, anterior palatine, posterior palatine, posterior superior alveolar, inferior dental, show the nerve trunks as they pass through them. It is very instructive for the operator taking up this work to practice placing the needle in the various regions for making injections. In this way he will become familiar with the depth and direction of the needle for blocking the nerve trunks. Many hours are required to properly prepare specimens but one is amply repaid for the careful dissection required to properly prepare them.

As above stated, too much emphasis cannot be placed upon the value obtained from dissections of this character and to emphasize this fact, I will call your attention to the following quotation, taken from an address of the eminent surgeon—the late Dr. John B. Murphy:

“When taking a new step in medical procedure, you have much more to think of than your own career. Your most careful thought must be for the patient. If you perform a new operation, do not do it for the first time on the patient. Do it on the cadaver and on the dog. May I add here a few words to aid you in the development of your surgical technique? If I had to state where I acquired the greatest amount of technical knowledge, where I received the greatest benefit in the way of gaining confidence in my own operative procedures, I should say that practically all of it was acquired from operations on the dog and from operations on the cadaver.”

#### ADVANTAGES OF NERVE BLOCKING ANESTHESIA.

1st—Freedom from general anesthetic accidents, blood changes and anesthetic discomforts in most cases.

2nd—Duration of anesthesia may be changed according to the various amounts of the vaso-constricting agent used in the injecting solution. The long duration of anesthesia is of great value to the



operator for the removal of impacted third molars, draining the antrum, apicoectomy, alveolotomy, removal of tumors and cysts, resection of the jaw, curettement of necrosed bone, plastic operations, tonsillectomy and many other operations which come under the observation of the oral surgeon.

3rd—The long duration of anesthesia permits the operator to take his time with the operation which gives him an opportunity to employ his skill while operating.



FIG. 7.

This wet specimen was carefully prepared to show important anatomical structures which are valuable to the oral and dental surgeon. The tissues of this specimen are almost as soft and pliable as during life.

4th—Large or small areas may be anesthetized, depending upon the nerve or nerve branches to be blocked.

5th—One or two insertions of the needle will block an operative field, depending upon the nature of the operation and the area to be blocked.

6th—Anesthesia is secured over infected or inflamed areas by blocking the nerve branch and healthy tissue at a distant point from the operative field.



7th—Nerve blocking injections, when successfully made, are without pain to the patient because the needle is inserted into the mucous membrae and loose connective tissue.

8th—Co-operation of the patient—it is well known that this is of material advantage to the operator, because he can operate with ease and complete the operation with a minimum amount of laceration and without the inspiration of blood and mucous.

#### DISADVANTAGES OF NERVE BLOCKING.

1st—The disadvantage of local anesthesia is the patient's knowledge of what is taking place. This can be overcome in nearly every case if the anesthetist is tactful, masterful and assuring. If the patient is very nervous, a general anesthetic should be employed if the nature of the operation warrants its use.

2nd—When the tissue is highly inflamed, and the oral cavity is extremely septic, containing pus, it would be bad practice to make intra-oral injections and then the extra-oral injections should be employed such as the blocking of the second and third divisions of the fifth nerve.

3rd—In certain cases of oral surgery which have caused a great deal of inflammation to distant parts, such as the muscles of mastication and temporo-mandibular joint, even if the terminal branches of the fifth nerve are blocked, the patient would in many cases experience pain from distant regions during the manipulation of the tissues during the operation for the very reason those parts have not been blocked. In such cases it would be far better to make extra-oral blockings so that these parts would be anesthetized or employ general anesthesia.

4th—In certain pathological conditions, such as emphysema, arterio-sclerosis, myocarditis, and other pathological conditions wherein a high blood pressure is contra-indicated, it would not be advisable to inject a large quantity of local anesthetic solution containing a high percentage of the vaso-constricting agent in view of the fact that its action produces rise of blood pressure.

#### LOCAL ANESTHESIA CLASSIFICATION.

It is impossible for me to-night to go into the detailed technique of all the various nerve blocking injections of head and neck. However, I have the stereopticon slides with me and if time will permit I will run them through as quickly as possible and give a brief synopsis of various injections.

I will now endeavor to give the classification of nerve blocking enumerating the various divisions and sub-divisions, and mention the nerve branches which are blocked.

#### CLASSIFICATION.

Nerve Blocking:



Peri-neural.—Extra-Oral and Intra-Oral—See below.

|                                      |                    |
|--------------------------------------|--------------------|
| Endo-neural.                         | Sub-mucous.        |
| Regional.                            | Sub-periosteal.    |
| Intra-osseous (missing link).        | Pressure.          |
| Terminal, infiltration or peripheral | High pressure.     |
| Schleich infiltration.               | Spinal anesthesia. |
| Peridental.                          | Refrigeration.     |

# NERVE BLOCKING—INTRA-ORAL BLOCKING FOR:

|                                |                                 |
|--------------------------------|---------------------------------|
| Second divisions of Trigemini. | Infra-orbital.                  |
| Inferior dental-lingual.       | Naso-palatine.                  |
| Mental.                        | Anterior palatine.              |
| Incisive.                      | Middle palatine.                |
| Lingual.                       | Posterior palatine.             |
| Posterior-superior alveolar.   | Tonsillar plexus and pharyngeal |
| Middle-superior alveolar.      | plexus.                         |
| Anterior-superior alveolar.    |                                 |

# EXTRA-ORAL BLOCKING FOR:

|                                    |                              |
|------------------------------------|------------------------------|
| Gasserian ganglion.                | Frontal.                     |
| Ophthalmic division of 5th nerve.  | Supra-orbital.               |
| Superior Maxillary division of 5th | Lachrymal.                   |
| nerve.                             | Anterior-superior alveolar.  |
| Inferior Maxillary division of 5th | Inferior dental-lingual.     |
| nerve.                             | Posterior-superior alveolar. |
| Infra-orbital.                     | Cervical plexus.             |

# NERVE BLOCKING FOR: TONSILLECTOMY—NERVES BLOCKED:

|                   |                     |
|-------------------|---------------------|
| Tonsillar plexus. | Anterior palatine.  |
| Pharyngeal.       | Middle palatine.    |
| Plexus.           | Posterior palatine. |

# NERVE BLOCKING FOR:

|                        |                  |
|------------------------|------------------|
| Head and neck surgery. | General surgery. |
| Plastic surgery.       | Oral surgery.    |

By the perineural method of nerve blocking, the solution is injected into the neighborhood of the nerve trunk supplying the operative field and the solution reaches the nerve by diffusion, while with the endo-neural method, the needle point is inserted into the nerve direct and the solution injected. The latter method has practically no value in the production of anesthesia for oral surgery. We are aware of the fact that the finest branches of the terminal nerves are covered only by a very thin sheath and this sheath increases in thickness as it passes toward the brain. It is evident that the smaller the nerve the more readily an anesthetizing solution will reach the fibres surrounded by the nerve sheath thus blocking painful im-



pulses. Now it can be said that the larger the nerve trunk and the thicker the nerve sheath, a longer period of time must be allowed for the solution to produce complete anesthesia for that particular nerve trunk. Some operators overlook this particular phase of technique in not allowing sufficient time to elapse between the time of injection and the time for operation. For the terminal anesthesia method the solution is injected into a circumscribed area and the solution comes in contact with the fine terminal endings and their sensory end organs. The area of operation is infiltrated and has its



FIG. 8.

The above wet specimen shows the needle in correct position while injecting the solution for the posterior superior alveolar nerve. A special needle with curvtd hub is used.

drawbacks in many operations. It is highly gratifying when the members of the medical and dental professions realize that the birth-place of both general and local anesthesia was in the United States and was principally developed by American surgeons, dentists and anesthetists.

The first advocate of deep injections was the American Corning who introduced it to the profession in 1887. To Dr. George B. Crile, of Lakeside Hospital, Cleveland, Ohio, belongs the credit of first employing nerve blocking by the direct intraneural method in



major operations and reported the first case before the Ohio State Medical Society. The operation was for the amputation of a leg under nerve blocking, later followed by Prof. Matas, of New Orleans. Following this Braun called the method "conduction anesthesia," and has contributed wonderfully to this subject. Worthy mention must also be made of the good work of Allen, Hertzler, Crile on anoci-association, Fisher, Puterbaugh, Neiman, Potts, Prinz, Schultz, Lyon, Thoma, Blum, Berger, and Silverman. These men have contributed wonderfully to this important link in anesthesia and their findings have proven of great value to the members of our profession. It appears to me that the term "nerve-blocking" is superior to the term "conduction."



FIG. 9.

Correct position of needle when the point is resting near the posterior superior alveolar foramen. Needle with slightly curved hub is employed.

#### TIME TO WAIT FOR ANESTHESIA.

The time required to wait for anesthesia following the injections, depends upon these factors:

- 1st—Percentage and amount of anesthetizing solution injected.
- 2nd—Diameter of nerve trunk and thickness of the nerve sheath.
- 3rd—The skill of the operator in depositing the solution in the right location. It is self evident if the solution is not injected near the nerve trunk, good anesthesia will not be secured. The operator must bear in mind the required time to wait for anesthesia, and not be too hasty beginning the operation before complete anesthesia has intervened.

It might be stated here in a general way, that the time to wait



following the injections of solution into the various nerve trunks, supplying the operative field of the oral surgeon and dentist, is from one-half minute to fifteen minutes, depending upon the size of the nerve or nerve trunks which have been blocked.

#### TECHNIQUE.

It is impossible, as stated before, to cover the detailed technique of all injections in this short time. In all we have something like thirty injections for operations within the oral cavity, jaws, face,



FIG. 10.

Tuberosity injection. Note position of syringe for blocking posterior superior alveolar nerve.

head and neck, and I will attempt only to partially cover some of the most important ones.

#### BLOCKING THE POSTERIOR SUPERIOR ALVEOLAR NERVE.

This can also be termed Tuberosity Injection.

After the tissues in the region of the installation of the needle have been thoroughly prepared by cleansing, drying and receiving the proper antiseptic solution, the following technique is applied:

The patient's mouth is about one-half open. With the fingers of one hand to pull the cheek laterally so as to expose the area of injection, insert the needle into the mucous membrane at a point where the tissue of the cheek blends with that of the gum tissue.



The needle is inserted one-half cm. above the apex of the disto-buccal root of the upper second molar. The needle employed is 3 cm. in length and 24 gauge. It has an extension of hub and is slightly curved which assists the operator in forcing the needle around the posterior lateral curvature of the superior maxillary bone. It must be borne in mind that the posterior superior alveolar foramen is located at a point 2cm. above the disto-gingival margin of the upper third molar. This foramen being located around the curvature of the superior maxillary bone, it will be found that it can be reached much easier,

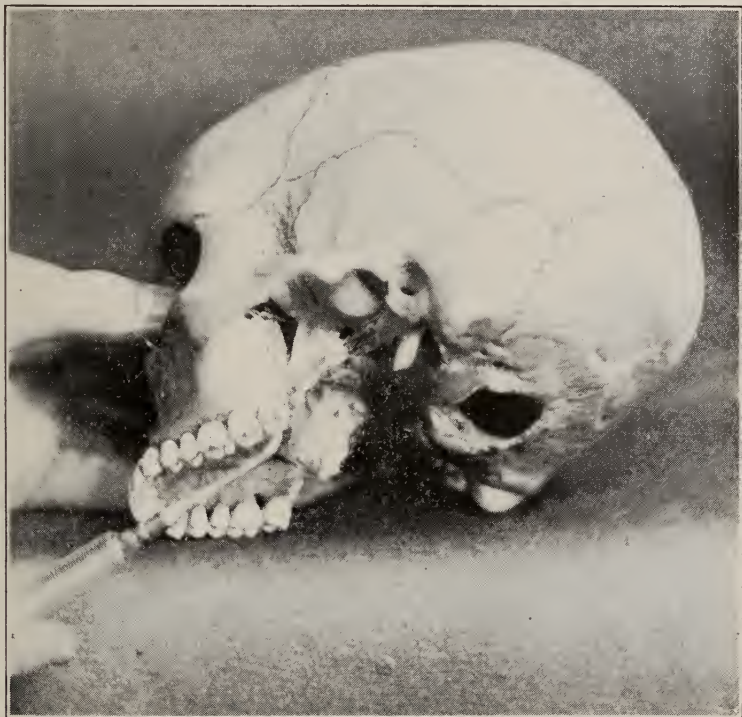


FIG. 11.

Position of specially constructed needle on the skull to show position for blocking the second division of fifth nerve by the intra-oral method.

when the needle, which is contained in a slightly curved hub, is employed. It is true that a smaller needle can be used successfully for this injection, but it is necessary to hold the syringe laterally, much more than it is necessary to stretch the patient's cheek in order to force the needle around the curvature of bone, and then it is impossible for the point of the needle to reach the posterior superior alveolar nerve, as it passes into the foramen of the same name.

After the needle punctures the mucous membrane, it is carried upward, backward, inward to a depth of 1 cm. When the depth has



been reached the syringe is carried laterally working it back and forth slightly until the point of the needle strikes the periosteum covering the posterior lateral curvature of the superior maxillary bone. By striking the periosteum it proves that the needle is in contact with same and if this is accomplished the needle is forced upward and backward directing it at a point 1 cm. above the roots of the third molar until another cm. of the needle has disappeared. The needle should now be in the tissue to an approximate depth of



FIG. 12.

Note position of hub of needle while needle is resting in proper location for blocking the second division of the fifth nerve by the intra-oral method.

2 cm. and by the needle being 3 cm. in length, there will be 1 cm. remaining on the outside.

In other words, the needle is inserted to the gold plate mark. The needle is carried around the tuberosity in contact with the periosteum and by using a needle as described it is an easy matter to reach the immediate region of the nerve trunk to be blocked and excellent results will be obtained following the injection.

I am quite aware of the fact that the location of various nerves will vary, but if the needle is started in the tissue, as above stated



and is carried in the direction as given and to the depth of 2 cm., good results must be obtained.

Two cubic centimeters of the anesthetic solution is injected slowly and anesthesia will be obtained in the upper second and third molars, alveolar plate of bone, periosteum, gum tissue, and mucous membrane on the buccal side in from three to ten minutes following the injection. A point which must not be forgotten is that the posterior superior alveolar nerve anastomoses with the middle superior alveolar nerve at a point above the upper second bicuspid and first molar teeth. The upper first molar tooth is the dividing line between this injection and the one made anterior. It is not possible,



FIG. 13.

Note the needle resting along the posterior lateral curvature of the superior maxillary bone. This is the correct position for blocking the second division of the fifth nerve.

only in some cases, to obtain anesthesia of the upper first molar following the tuberosity injection, due to the fact that pain would be transmitted over the middle superior nerve which has not been blocked. The dental plexus which is formed from the branches of the posterior middle and anterior superior alveolar nerves is quite a complex arrangement of nerve fibres, and in order to block the area of the two superior bicuspids and the first molar it is necessary to make another nerve blocking injection. This area, as above stated, is supplied by the middle superior alveolar nerve and is one of the few nerve branches which cannot be reached by the needle due to



the fact that it is located beneath the bone. That is in the outer wall of the antrum of Highmore. Personally, I block this area by using the method of intra-osseous anesthesia which I have worked out within the past few months and will explain in detail later on.

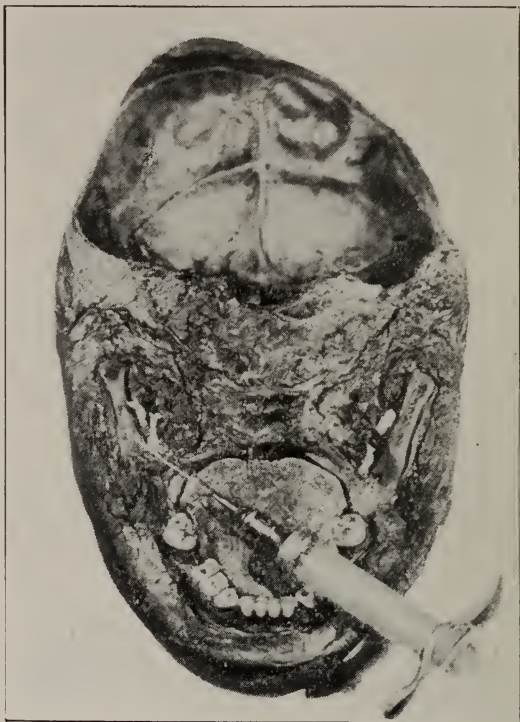


FIG. 14.

Horizontal section of a specially prepared specimen. The incision extended from the angle of the mouth 1 cm. above the parallel to the occlusal plane of the lower teeth posteriorly through the base of the brain. This section shows the hypodermic syringe and needle in the first position for blocking the inferior dental and lingual nerves. The point of the needle is resting against the periosteum covering the inner oblique line of the Ascending Ramus. Note the needle is parallel with and one centimeter above the occlusal plane of the lower teeth.

#### BLOCKING THE SECOND DIVISION OF THE FIFTH NERVE—INTRA-ORAL METHOD.

The writer worked out the technique for this particular injection some months ago and used it in a large number of cases with satisfaction. This injection, with several others, was carefully worked out on the cadaver and they promise to be of exceptional value not only to the oral surgeon, but also to the eye, ear, nose and throat specialist as well. The blocking of this large nerve trunk is an easy



matter provided the operator is thoroughly acquainted with its technic. The maxillary or second division of the fifth nerve passes from the brain through the foramen rotundum and crosses the spheno-maxillary fossa entering the floor of the orbit. At this level the spheno-maxillary fossa, from the foramen rotundum to the posterior part of the orbit is, in the average case, from 7 to 10 mm. in width. The needle is inserted into the region of the second division



FIG. 15.

This illustrates the second position of the syringe. It is carried across the median line from its original position to a point outside of the arch on the same side of the injection. The needle point is resting against the Lingual Nerve which is located at the depth of ten millimeters in most cases.

posterior to the floor of the orbit and the solution injected. The technique for the injection is as follows: Use a needle 36 mm. long, 24 gauge, attached to an extension hub having a certain curvature. The mucous membrane is punctured by the needle in the fold where the cheek blends with the gum tissue at a point superior and lateral to the upper third molar. The needle is now directed upward and inward keeping it in contact with the periosteum covering the posterior lateral curvature of the tuberosity of the superior maxillary



bone. This route is devoid of arteries and veins. The depth of the needle is approximately 3 cm. in the average adult case. The amount of solution used is 3 cc. Time to wait for anesthesia is from 5 to 15 minutes. Anesthesia is secured in all the parts which are supplied by the second division of the fifth cranial nerve. The following operations can be performed: Resection of the superior maxillary, extraction of teeth, reduction of a fracture, amputation of roots of teeth, establishment of drainage or curettement of the antrum and nasal



FIG. 16.

The syringe is now carried across the median line in the region of the Cuspid Tooth. The needle point is resting against periosteum near Inferior Dental Foramen forming an acute angle with the surface of Ramus. Depth in most individuals is two centimeters.

operations. If the opposite side is blocked operations near and involving the medium line as well as on the opposite maxillary bone can be performed, including operations for hare-lip and plastic operations.

#### MANDIBULAR-LINGUAL ANESTHESIA.

##### *Blocking the Inferior Dental and Lingual Nerves—Intra-Oral Method.*

Have the patient open her mouth as wide as possible, place your



index finger against the ascending ramus allowing the palm of the finger to rest upon the occlusal surface of the lower teeth. Great care should be exercised to not mistake the dense connective tissue, which covers the anterior surface of the masseter muscle in some cases, for the ascending ramus. This can be overcome by having the patient open and close the mouth slightly, and should the index finger rest against the anterior surface of the masseter muscle it will be found that resistance will vary, whereas, if the tip of the index finger rests against the ascending ramus the resistance will remain the same. Next locate the external and internal oblique lines and the trigonum retromolare with the dorsal surface of the finger toward the median line. Allow the radial side of the index finger to rest upon the occlusal plane of the lower teeth. Now retract the mucous membrane beneath the finger to give ample room for the needle to pass the end of the finger nail. Now force the needle through mucous membrane, striking the inner oblique line. The width of the average index finger is 2 cm. and when the mucous membrane is punctured at the middle of the finger nail, it makes an excellent guide in puncturing the mucous membrane in this location. The distance from the puncture of the mucous membrane to the periosteum covering the inner oblique line is about 5 mm. Allow the barrel of the syringe to rest over the bicuspid on the opposite side of the mouth. Be careful to keep the needle a distance of 10 mm. from the occlusal plane of the lower teeth. When the internal oblique line is reached with the needle, cross the median line to a point outside the arch on same side of injection. Be very careful not to allow the point of the needle to go beneath the periosteum. When the syringe is on the outside of the arch on same side of injection insert needle posteriorly about 5 mm. and inject one-half cc. of the solution so as to anesthetize the lingual nerve. The lingual nerve is located 5 to 7 mm. from the inner surface of the ascending ramus. Now bring the syringe back across the median line, this distance being governed by the amount of divergence of the two rami. Now insert the needle 10 mm. to reach the inferior dental nerve. If the syringe has been held in the proper position the point of the needle will reach the periosteum at an acute angle to the inner surface of the ascending ramus in the region of inferior dental foramen when at a depth of approximately 20 mm. Before injecting the solution into the mandibular fossa, it is well to work the syringe back and forth one or two millimeters and inject the solution only when the point of the needle rests against the periosteum.

Inject one and a half to two cc. of this solution for the inferior dental nerve. It is necessary, for best results, to work the syringe back and forth slightly at the time the solution is being discharged, in order to assist the tissue in absorbing the solution and not to cause a too rapid distension of the soft parts. The amount of solution used for in-



ferior dental and lingual nerves in the average case in two and one-half cc. If the operator is skillful in his technic, operations can be begun, in some cases, within five minutes after the injection. The needle used for this injection is 30 mm. long and 24 gauge, made of iridio-platinum. Anesthesia will be secured in the greater part of the lower jaw.

The producing of anesthesia near the median line depends upon how rich the nerve supply is in this particular region between the inferior dental and lingual nerves on the injected side and their fellow nerves on opposite side. Following the blocking of the inferior dental-lingual nerves on both the right and left sides of the mandible, anesthesia is produced in the lower jaw in the greater percentage

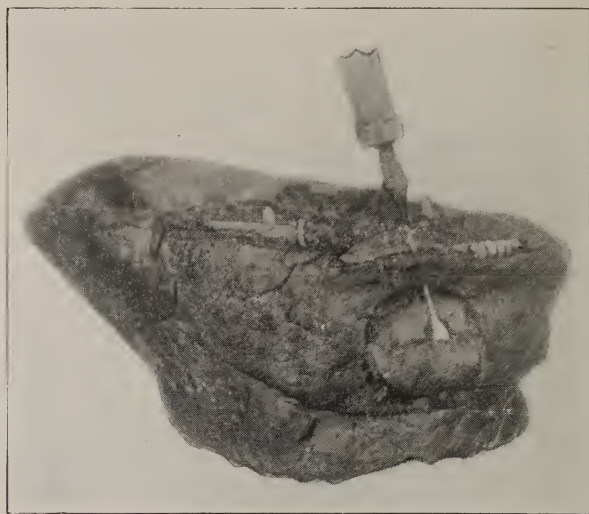


FIG. 17.

Horizontal section of a wet anatomical specimen showing exposed Mental Nerve. Needle is in contact with periosteum only at Foramen.

of cases. In a small percentage of cases the blocking of these various nerve trunks on both sides does not render insensible to pain the tissue in the region of the median line labial to lower incisors, because the cervical plexus in a few cases supplies this particular region with nerve branches. When this is found to be the case, the incisive nerve-blocking injection is made by inserting the needle at the side of the median fold of mucous membrane and forcing the needle into the base of the left incisor fossa, then retract the needle without taking it out of the tissue, and force it down into the right fossa and inject the solution. Deposit 1 c. c. in each fossa. The blocking of these nerves should be sufficient to enable the operator to extract all of the teeth, reduce a fracture, remove necrosed bone,



remove pulps from the teeth, or remove a cyst or tumor either in the region of the mandible or from the soft tissues in the floor of the mouth.

### MENTAL ANESTHESIA.

The mental foramen is located midway between the lower border and alveolar border of the lower jaw, and in fifty per cent of the cases below and between the apices of the roots of the two lower

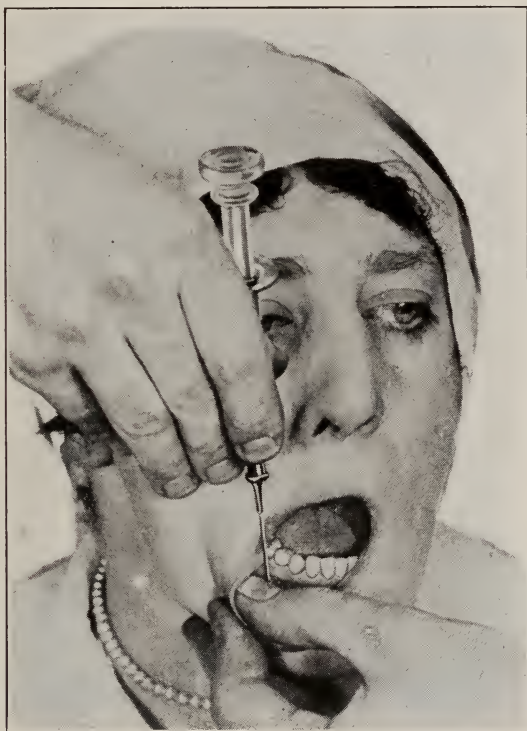


FIG. 18.

This illustration shows the correct position of hands and syringe while blocking the Mental and Incisive Branches of the Inferior Dental Nerve. The needle is directed downward and inward to a depth of one centimeter, at which point the needle should be at opening of the Mental Foramen.

bicuspid. In twenty-five per cent of the cases a slight distance anterior to this point, and in twenty-five per cent of the cases a short distance posterior to this point. Stand behind your patient, locate the mental foramen with the index finger by palpation or pressure. When direct pressure is brought to bear over the mental nerve, as it emerges from the mental foramen, the patient will experience pain due to the fact that the mental nerve rests upon the sharp margin of the anterior portion of the mental foramen. Depress the lip with



your thumb and insert the needle into the mucous membrane at a point where the cheek blends with the gum tissue, just buccal to the second bicuspid. Direct the needle downward and inward pointing it toward the foramen. Insert the needle approximately 10 mm. Strike the periosteum only at a depth as above given and the point of needle should be near the foramen. Care should be taken not to allow the point of the needle to come in contact with the periosteum



FIG. 19.

This photograph shows the needle point resting in the Left Incisive Fossa for blocking the Left Incisive Nerve. Needle enters tissue between and below roots of Central Incisors in the median line. If opposite side is to be blocked, retract needle and force into right fossa without taking needle out of tissue.

before the region of the foramen is reached, from the fact that the surface of the bone at this point contra-indicates following same with the needle. Inject two c. c. of the solution. Massage the skin over the area forcing the solution through the foramen thus anesthetizing the incisive nerve in the inferior dental canal which is a continuation of the inferior dental nerve. You will secure anesthesia of the two bicuspid and in some cases the cuspid. This injection is sufficient for cavity preparation or pulp removal. If you extract these teeth



it will be necessary to block the lingual nerve on the lingual side. The time required for anesthesia will vary from 5 to 10 minutes if injection has been made properly. The needle used is either the one 30 millimeters in length or the 15 millimeter needle. Both needles are 23 gauge.

#### INCISIVE NERVE BLOCKING.

This injection is used for blocking the lower incisors and proves of great value to the pyorrhea specialist. Insert the needle at the median line below the roots of the two incisors at a point where the lip blends with the gum tissue. Direct the needle downward, backward and laterally to an approximate depth of 10 millimeters, striking the floor of the incisive fossa. Inject one c. c. Retract the needle without removing it from the tissue and bring the syringe to the opposite side and repeat the technique for the opposite fossa in case the nerve supply for all four incisors is desired to be blocked. The incisive fossa have numerous small foramina which transmit branches of the incisive nerve and when the solution is injected at this point anesthesia is secured in most cases in 3 minutes. The needles for this injection are similar to those used for mental anesthesia. Always remember that it is necessary to block the nerve supply on the lingual side in case you desire to extract or do any kind of operative work which involves the structures on the lingual side.

*(To be Continued in December Issue)*



REPAIRING HOLE IN A GOLD CROWN.—If in the finishing process a hole is made in a gold crown, paint the outside with a mixture of thin whiting, except round the hole. Plug the hole with gold foil, touch it with borax, and use a little gold solder inside the crown. Fuse with blowpipe and a good repair is the result.—C. A. K.

DENTIN.—I never expose freshly cut dentin to the fluids of the mouth when I can help it, and whether I do or do not, treat it to a touch of oil of cloves. Treating the cavity with alcohol followed by oil of cloves warmed with a puff of hot air from your chip blower, and the cavity stopped with gutta percha until the patient returns, will prevent the sensitiveness sometimes complained of after an inlay. Not only that, pulps are not so likely to die.—Homer Almon, *Dental Review*.



## Our Buffalo Letter—From Habec

I AM taking this opportunity, while comfortably riding through the beautiful country traversed by the New York Central Railway from New York to Buffalo, to write the long deferred letter promised months ago.

We are speeding away from Albany, where I have just parted company with a young lieutenant of the 22nd Canadian Army Division, whose face was wreathed with smiles at the prospects of reaching home within a few short hours after three years' service "over there.."

The meeting has brightened my spirits even as the wondrously beautiful autumn foliage has enhanced the gorgeous prospect of the Catskills as we whisk along. I must stop for a moment and take a mental survey of this young Canadian soldier who is to enjoy six months' relief from that hellish struggle of the nations. He is, I am sure, not unlike the great majority who have seen long service, in the changes that have come to him. Three years ago he was a happy, care-free youth without a line or suggestion of seriousness in his face. To-day he returns home bearing the countenance of a man ten years his senior. The deep corrugated lines of the forehead; the drawn, compressed muscles of the mouth; the almost furtive, expectant and appealing timidity of the eyes tell the story of hundreds of days of watchful anxiety and fear-impregnated nightly vigils.

A mature manhood has arrived before its time and a fond mother is to be distressed by the sudden leap that has robbed her of her boy. A man of brave deeds, whose splendid character has been tempered by the fires of war is to appear before her. There is the accompanying jerking of the head and the twitching of the muscles of the trench fighter, but there is no sign of weakness or wavering of purpose. Every move betokens the soldier who is ready to fight for his country but more ready to welcome honorable peace.

"Ah," said he, with the attractive accent of the French-Canadian, "How much easier we walked away from the trenches when orders came. We could walk twice the distance in the same time. Everybody singing because we were alive to go back." He did not tell of the heavy feet and the forced tread when marching silently into the gunfire of the Hun: No; he took the happier viewpoint because of its enspiriting influence and cheering effect. He did add, however, that he never marched toward the westward line without the omnipresent thought of who would return and who would not. "Will this be my time? But after two or three hours of conflict, that thought vanished and we were just fighting machines."

Four officers and one hundred and fifty men went into action. One officer and one man returned. He was the officer. Twenty-four officers and six hundred men went forth and less than forty re-



turned. Again his Patron Saint smiled upon him. But he is still a boy, happy to talk of little things. Keen in the joy of anticipation, with eyes that sparkle at the thought of again, for a few short months, living the life of the youth of three years ago.

Of such material is the rank and file of our brave boys composed. Youth, buoyancy, impetuosity, and intrepidity is the formula that the Kaiser *must* swallow and which will prove a deadly poison to his rotten military system.

Well, Wallace, I dwelt longer than I intended to upon your young soldier because these young men impress me profoundly and because it is a brief pen picture of thousands upon thousands that the great Dominion of Canada has torn from her loins and tearfully pushed from her breast into that gaping maw whose insatiable rapacity cannot be measured by human standards.

And now to more pleasant fields! Doubtless a majority of your readers have forgotten the erstwhile quill-shover, Habec, whose agitation of good writing fluid was, with irregular infrequencies, reflected upon the pages of Oral Health in the happy and cherished days of former peace. To those who remember, we greet with the old time friendly squeeze and to the new lads, will make a little bow and say, we are glad you are here to chip in and help Wallace keep the printer from becoming a permanent fixture on his doorstep.

You must know that things dental are moving at double quick over on this side of the Niagara since Bill and Woodrow got into the scrap. Since that momentous day, April 6, 1917, we have emerged from dense obscurity and now stand before the world a regular made-to-order profession. Our Dental Reserve Corps will soon be increased to 9,000 members, a goodly percentage of which will have had special training in maxillo-facial surgery.

Since the days of Dental Practice and our good old friend, Rob Reade, this old world has changed in many ways, in thought as well as deed. The one thing uppermost to-day is to get the Kaiser's goat and every good punch our lads put in makes the goal less remote. The work the C.A.D.C. has done has set the hottest pace and we are bound to be with you at the finish of the race.

Great things have taken place in the dental department of the Medical Corps since we entered the war. On Sunday, April 15th, 1917, the Committee on Dentistry of the General Medical Board, Council of National Defence, was formed and a dental reserve corps was duly organized. From that moment a most intensive program was started and there has not been a breathing spell since. Volunteers for the dental reserve were called for and after entrance examinations were waived, from June 15 to Oct. 15, 1917, fully 5,700 applications were received and the list was closed because more than was needed were already commissioned as First Lieutenants.

Recent legislation now permits double the original number of



dentists to each thousand fighting force, in consequence of which the dental reserve corps will be increased to a full 10,000 by July next. Colonel Logan believes this number will prove adequate for our needs, however, it will require the assistance of the civilian dentists to meet the great demands of rehabilitation service for our returned fighters.

We are paving the way for the instruction of the civilian dentists in maxillo-facial surgery and mechanical restorations and hope to duplicate the course of instruction being given the Canadian dentists under Col. Guy Hume. This movement is going forward as rapidly as possible. Of course, we are anxious to pattern after you also, and have our own administrative establishment but we cannot afford to throw a wrench into the works at this time and allow anything to interfere with the great service we are rendering our boys. We must sit tight and

When the boys come home after shot and shell  
To our land of peace from the Hun-made Hell,

we will get busy and build a little roost all our own.

Some of you may know of the Preparedness League of American Dentists. Well, that's my bug and I have had it bad for two years and a half. The free dental service department of the League has made dentally fit no less than 300,000 of our men and we "still go marching on." I won't allow myself to get started on this subject else I would write a book. However, I do want to say to you before the last drop of ink is out of my Waterman, that the idea of the League came about through the plan of volunteer service you gave early in the war. Many good things have come to us from Canada and we are duly thankful therefor. I hope we can reciprocate and assure you that what is ours in yours also. Our greetings to the boys "over there."

Yours in the greatest cause,

HABEC.

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## Devitalizing Pulp For Crowns

BY H. J. GOSLEE, D.D.S.

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**A**BOUT eighteen years ago I read a paper before the Chicago Dental Society in which I took the position that the pulps of teeth which were to be prepared for the reception of gold crowns should almost invariably be devitalized, with certain exceptions duly noted. I want to say now that I did not mean at that time that this procedure should be followed because it was easier to do it that way, or because of the fact that the pulp had no phy-



biological value whatever, or because a tooth with a dead pulp in it would be better than a tooth with a live pulp in it. Not at all. But what occasioned my remarks and caused me to take the stand I took was this: it had been my observation that it was quite—if not, indeed, almost—impossible for me to give to a tooth, a typical molar tooth, for example, the necessary mechanical preparation which would permit me, or make it *possible* for me to properly and more or less accurately fit that tooth with a telescoping band if it had a vital pulp in it. Hence, I took the stand that, since irritation of a mechanical nature must result if the band did not fit, and since it was absolutely necessary, therefore, to make the band fit, that in order to have a band which did fit if it became necessary for mechanical reasons to devitalize the pulp in order to enable me to do it, that is what should be done, and I am still of the same opinion to-day. Of course, we should conserve the vitality of the pulp of every tooth whenever and wherever it is possible, but I will also submit that if we need to use that tooth, and if that tooth demands restoration, and then if *adaptation* is one of the requirements of success and permanency in the restoration, whatever may be the type of restoration used, and if in turn it is necessary to devitalize the pulp in order to effect and obtain that adaptation, then to do it rather than to leave the pulp alive at the expense of correct adaptation is the better practice. This has to do with the absolute mechanical requirements of peripheral adaptation in the preparation of teeth for the reception of gold shell crowns.

I now want to ask you this question: If it is thus practically impossible to prepare a typical tooth for the reception of a gold shell crown such as we now make, when the tooth has a vital pulp in it, is it possible to give to teeth such further peripheral preparation as the shoulder crown demands, and still conserve the pulp? That the shoulder crown is a beautiful form of mechanical adaptation there is no question. Its application affords a means of obtaining a continuity between the artificial restoration and the supporting root, and, as that continuity may be made more or less perfect, in that same proportion will the degree of irritation become less and less. If it is true that it is usually quite impossible to prepare a vital tooth for the reception of a telescoping band which fits over the outside of it, then how can we cut enough more to form a shoulder and thus obtain a more perfect continuity in the adaptation of the crown to the root? It is possible that in Minneapolis, under ideal conditions, this may be done, but, generally speaking, I have not been able to do it, and I do not believe the conditions are any different to-day than they have been at any time since I have been in the practice of dentistry. We all want to save the pulps of teeth if we can: It is our duty to do so. Nobody, I think, in this audience would question that a tooth with a vital pulp in it is a better tooth than a tooth



with a dead pulp in it; but if it becomes a question of whether we can utilize a tooth with a dead pulp in it to better advantage than we can by conserving its vitality, which of the two routes should we take? Our signal ambition in the decision which we must make should be the degree of permanency, usefulness and comfort which will obtain, and this will always be a question largely, if not entirely, of judgment on our part, and judgment can only come from experience.—*Dental Review*.

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## An Appreciation

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LIEUTENANT FREDERICK A. BALLACHEY.

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THE eighth district Dental Society, of the State of New York, has met an irreparable loss by the untimely demise of Lieutenant Frederick A. Ballachey. The Society never had a better member nor one who will be more profoundly missed.

Why is this true? Because Lieutenant Ballachey was every inch a professional man; one who championed every good movement; an ardent, faithful, fair-minded worker in whose nature no guile ever entered. Surely, it is worth a life well spent to, at its close, be able to challenge the whole world to point a single finger in disapprobation of the loved one who is gone and find not one to meet this challenge. Such is a pen picture of our beloved and lamented, Fred Ballachey.

He fell in battle, not on the firing line pitted against our common enemy, but in an unequal struggle against the dread pneumococcus, at Camp Dix, New Jersey, on Sept. 26, 1918. He fell in defense of the flag of his adoption and the honor could not have been greater had his adversary been a whole battalion of wily Huns. We place his name first on the roll of honor for this society and for the dental profession of the City of Buffalo.

Lieutenant Ballachey was one of the first to apply for a commission, doing so through the Medical Corps in February, 1917, two months before a Dental Reserve Corps was formed. When it was finally granted through the Dental Reserve he was anxious to be placed on active duty. This did not occur until July last, when he was assigned as dental officer at the training quarters of the Fighting Mechanics in Buffalo. Early in September he was transferred to Camp Dix and had scarcely entered upon his duties when the grim reaper ruthlessly cut off his active usefulness and blighted a future dedicated to the noblest service a man can give.

His example will live in the hearts of all his fraters, and his service to humanity is not yet accomplished. We mourn him as a man, a Christian, a dentist and a soldier, and the heartfelt sympathy



of all goes out to his bereaved wife, child and relatives. We revere his memory for all his noble qualities.

Of brilliant hue, we'll place his star  
On memory's Honor Roll,  
The path we tread 'twill light afar  
Toward duty's righteous goal.

J. W. BEACH, BUFFALO.

\* \* \* \* \*

AS a classmate of the late Dr. Ballachey, the writer feels privileged to speak for Fred's many Canadian friends, who will ever hold the deepest feelings of respect and admiration for his many manly qualities. He was loved by his fellow-students because of his unselfishness, and an ever willing spirit to help the other fellow. Ontario knew Dr. Ballachey as a dental practitioner, for but a comparatively short space of time. New York State gained what Ontario lost. Fred was an honor to Canadian dentistry and to his alma mater, The Royal College of Dental Surgeons of Ontario.

WALLACE SECCOMBE, TORONTO.

## Method of Retaining Bridge and Partial Dentures, With Special Reference to Large Restorations\*

J. W. BEACH, D.D.S., BUFFALO, N. Y.

THE most apathetic practitioner of dentistry to-day must realize that a great metamorphosis is taking place in the requirements and methods of dentistry.

We have abruptly come to a parting of the ways where time-worn and moss-grown theories and conceptions must give way to the new order of things. We are obliged to discard, trim and revise until scarce a semblance of former methods and procedures now remain. This condition, not only is due to common sense and practical reasoning, but the shock of the battle has jarred us into an entirely different frame of mind.

Illusive theory and day dreams have been supplanted by work and actuality and every minute of time must be given to the accomplishment of practical results. Therefore, I feel justified in presenting a few details in connection with a certain means of supplying large restorations, particularly for our soldiers who return to us in need of such service. For this reason only do I feel that I have a right to deal with the subject at this time.

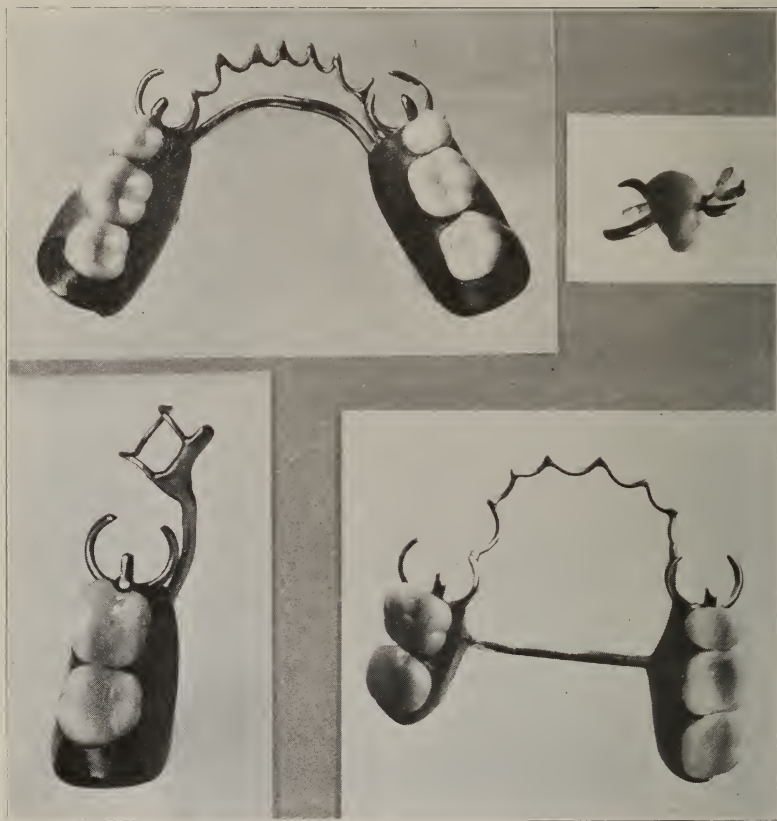
I will not enter into a pre-discussion of accepted and recognized methods of bridgework, as the thoughts I wish to present appertain to

\*Read before the Hamilton Dental Society.



the specific object I have mentioned, and not to a distinct method for general adoption. Another object is that the thoughts presented may be further developed by others and thereby increase the application and enlarge the scope of usefulness. It will give me great pleasure and satisfaction if some idea presented may be utilized to the welfare, even of a few of those defenders of our flag who have been injured about the mouth and jaws in battle.

Support and retention for the pieces to be described is gained by



use of clasp wires; utilizing the clasp, suspension and cantilever principles. These I have employed with more or less satisfaction for a period of sixteen years. All methods of clasping have thus far been held in varying degrees of disrepute and only until recently has the advocate of the clasp been permitted to give favorable expression to his opinion before dental meetings. There are clasps and then there are other clasps, all of which I may say are still in the developmental stage. The standard universal clasp is yet to be perfected.



The first thought that comes to the dentist in connection with the clasp is the ancient and ingrown idea that it brings positive and absolute destruction to contacting tooth surfaces. We gladly coincide with this view in relation to the old form of broad clasp but when round wire is employed which gives but a line of contact to enamel surface, the first instance of disintegration or actual injury is yet to be discovered by me. Again, no piece should be placed in the mouth which cannot be removed and cleansed by the patient, except in special cases. This fact is accepted generally by the profession.

The wires employed in this method are gauges 10 half-round base-wire; 13 half-round for occlusal rests and universal clasps; 14 round for universal and full clasps; 16 round for loop clasps and the interdigital wire. This last development is the only feature of the work for which I claim originality and has proven a most valuable factor in the success of many cases. I will describe its construction and use by the aid of pictures on the screen. The use of the occlusal rest or tang is a positive necessity in the construction of the universal clasp.

I am pleased to quote the opinion of Dr. H. J. Goslee, who says that we are justified in trimming the occlusal surface of the tooth which supports the rest, also, if necessary, it is permissible to trim the opposing point of contact in order to gain sufficient space. I feel now that my practice of years has met with due justification.

I wish to recommend for the consideration of the profession the splendid dissertation on the clasp and its application by Dr. Goslee, printed in the March, 1918, Dental Item of Interest, page 191. The paper and discussion comprises a sort of compendium on this subject by which the profession may be guided. Both Dr. Essig and Dr. Ottolengui contributed valuable ideas, however, I am convinced that the views expressed by Dr. Goslee are fundamentally correct.

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The essayist showed by means of lantern slides the application in practice of the foregoing principles. The accompanying illustrations serve to indicate some of the more important features of this method of replacement which were presented to the society.

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Dr. John V. Conzett, President-Elect, N.D.A.

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OUR attention has been called to a typographical error in Dr. Thorpe's article of last month. Major C. Victor Vignes, of New Orleans, was elected president of the National Dental Association, while Dr. John V. Conzett is president-elect, not president, as announced.



# PRO BONO PUBLICO

This Department is edited by **Fred J. Conboy, D.D.S.**, and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

## Correct the Habit

VERNON FISKE, D.D.S.

A CERTAIN dentist was consulted by the parents of a two and a half year old child because her upper front teeth were considerably protruded. Upon inquiry, the dentist found that the child was still using the pacifier. He immediately advised the parents to see that its use was discontinued, and recommended that the irregularity of the teeth be corrected. The parents had failed to perceive that this undesirable habit was responsible for the condition of the child's teeth. Further, there are many more who do not realize to what an extent the teeth are influenced by habits. The most prevalent habit is mouth-breathing. On account of adenoids or other obstructions in the nose or throat, the child cannot breathe properly and is forced to obtain air through the mouth. When this occurs the normal muscular pressure of the closed lips is lost, and the front teeth shift forward. Thumb-sucking is another improper habit which often develops after the bottle or pacifier has been used. If this habit is persisted in, the upper teeth cannot erupt far enough, and a large opening is left between the upper and lower teeth in front, even when the jaws are closed. This and nail-biting, another common habit, may be corrected by placing oil of Quassia underneath the finger nail. Again, certain habits of the lips, such as drawing the corners of the lips inwards, cause narrowing and crowding of the teeth in front. Pressure on the front teeth by the tongue causes spaces to occur between these teeth. If the tongue is abnormally large, and the pressure is directed against the lower teeth, the whole lower jaw will move forward resulting in the "bull-dog" appearance of the mandible. Human nature is prone to become the victim of habit; habit soon becomes second nature. Therefore, to prevent mal-relations of the teeth, correct these bad habits early.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

LEMON FOR SMOOTHING THE HANDS.—Plaster and soap, owing to the alkalinity, roughen the hands. These can be quickly rendered smooth again by rubbing them with a few drops of lemon juice, which, moreover, has a decidedly bactericidal action.—*La Odontologia Colombiana*.

JAPS HAVE FINE TEETH.—“Rising Sun” (Japan) writes: “In a belated copy of P. W., which reached me recently, I read a statement to the effect that the Japanese don’t use toothbrushes, but their forefinger, for cleaning the gums and teeth. This, I should like to say, is not so. The first thing a Japanese does on rising in the morning is to take his toothbrush, dry, and a packet of toothpowder, and walk up and down his verandah or in his garden for five or ten minutes vigorously scrubbing his teeth. Among rich and poor alike, whatever else may be unimportant, the toothbrush exercise is never omitted. Hence, result the finest teeth I have ever seen.”

A WORD TO THE RADIOGRAPHER.—Let us reason together and see if we can not be mutually helpful one to the other, and serve the people better than we are doing. We—the men who do not make X-ray pictures—need your aid in many ways, and we cheerfully accord to you the ability to produce a better picture than we could possibly do. But we want you to remember this one thing and abide by it; you have absolutely no right to diagnose any case and pass your opinion upon it without consultation with the dentist who has had the case in charge. No X-ray evidence should ever be taken except in conjunction with the clinical history of the case. Not that we ask you to merely take a picture and remain passive in the matter. We welcome your opinion stated to us frankly, whether that opinion is right or wrong. You may be able to detect evidence in a picture that we would overlook, and we thank you for calling our attention to it. But we ask you to cease from this time making a diagnosis to the patient, and writing those mystic and formidable legends on X-ray pictures, “pus-pockets,” “infections,” etc., etc., and handing it to the patient.—*Commonwealth Dental Review*.



# ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, NOVEMBER, 1918

No. 11

## EDITORIAL

### The Effect of the War on Dental Practice

CIVILIAN practitioners are already being called upon to treat unusual conditions of the oral cavity and contiguous parts, resulting from disease or injury sustained by their patients during the progress of the war. The members of the profession should appreciate the fact that however skilful Army Dental Service is, or may become, the average soldier retains the greatest confidence in his former dentist and will, in the vast majority of cases, return to "the family dentist" for advice and service at the earliest opportunity. This places a great responsibility upon every dentist who has a patient "over there" and civilian dentists, who are wisely anticipating the situation, are seeking to prepare themselves that they may render the very best service possible in these cases.

While Post-war service will include every branch of dentistry, including special war prosthesis, it should be remembered that the dentist, because of his special training and facilities, will be called upon to restore lost tissue about the face, aside from the oral cavity. These cases include the placement of artificial nose, attachment of artificial eye to spectacles, including restoration of surrounding parts, parts of ear, etc., etc. The technique of all these methods and



operations should be familiar to dentists, who hope to give skilful advice and the most adequate dental service to returned soldiers.

"Be Prepared" is the motto back of the organization of a special class in Oral Surgery, Physical Diagnosis, Fractures, Splints, Anesthesia and War Prosthesis, to be given at the Royal College of Dental Surgeons during the week of 16th December to 21st December, 1918, inclusive. The College is to be congratulated upon taking the initiative in this matter and of having gratuitously placed the facilities of the college at the disposal of the class.

The course will be international in character, because of three factors in connection therewith:—

First:—The Preparedness League of American Dentists is co-operating with the College.

Second:—Two of the teachers are Americans and two are Canadians.

Third:—Five dental officers of the United States Dental Reserve and five dental officers of the Canadian Army Dental Corps are to be invited to attend, as guests of the class.

Dentists interested in such a course should communicate promptly with the Royal College, as doubtless the limited number of members will be secured at an early date.

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## The Supreme Need in Dentistry

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THE supreme need of the day is efficiency. The great world tragedy has proven that sham and camouflage will not avail.

To truly and faithfully fill our niche and perform our function, we must know all there is to be known about the particular work which we have undertaken to do. How does this axiom apply to the dental profession? How do we measure up? What efforts are we making to ascertain the truths relating to our work? How much research work is being done?

Men and women are suffering because we have failed to do our full duty. Dentistry to-day occupies the highest place in preventive medicine and to be efficient it must be based as much upon the knowledge gained in the research laboratory as upon clinical experience. It is in the research department that we have failed. The young men of our profession have the ability and desire to undertake this important work, public spirited men are prepared to assist by the contribution of money, but the man power and the money power must be brought together. A special committee has been formed in Canada for this very purpose. It is to be hoped that our graduates may be induced to spend an extra year at College in the intensive study of some department of dentistry. In case a worthy student



was financially unable to undertake the work, he could be given assistance from a fund raised by the committee for the purpose of defraying the expenses of research work.

The Dental Cosmos of September editorially treats of the subject of co-operation in scientific research and particularly co-operation among the dental scientific research laboratories, already existing, even though many of these be connected with industrial enterprises. To quote:—

“We clearly realize the crying need in dentistry for scientific research in the solution of an endless variety of problems that we deal with wholly empirically at present. A praiseworthy beginning has already been made toward a research foundation by the National Dental Association, but much more is needed if dentistry is to be placed upon a practically sound scientific basis. First, and most important, is the need for the same spirit of co-operation among the dental scientific research laboratories already established as that noted by President Rice as now existing among the research laboratories more particularly concerned with electrical engineering problems. The time is passing when dental research laboratories, even those connected with the large dental industrial enterprises, can be conducted wholly for commercial gain. No individual or corporation can rightfully control scientific research, and, as a practical matter of fact, those things which were formerly regarded as “trade secrets” quickly become common knowledge, so that the tendency is toward a broader view of these questions, for the spirit of the time tends toward interchange of ideas and practical co-operation in those lines of endeavor concerned with scientific development even among industrial enterprises.”

The dental profession in Canada expects much from the Dominion Dental Research Committee, but little can be done without the enthusiastic and generous co-operation of the entire profession. Canada is glad to back up the sentiments so well expressed by Dr. E. C. Kirk through the editorial columns of the Dental Cosmos.

### Atlanta—American Institute of Dental Teachers— January

**T**HE next annual meeting of the American Institute of Dental Teachers will be held at Hotel Piedmont, Atlanta, Georgia, January 28th, 29th and 30th, 1919.

Papers on the teaching of war dentistry and an exhibit of war appliances will be the main features, and along with these will be the usual papers on teaching methods.

All persons interested are cordially invited.

ABRAM HOFFMAN,

381 Linwood Ave., Buffalo, N.Y.

Secretary.



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 8

TORONTO, DECEMBER, 1918

No. 12

## Nerve Blocking

BY ARTHUR E. SMITH, D.D.S., M.D., CHICAGO, ILL.

(*ORAL HEALTH* is indebted to Dr. C. N. Johnson and the Dental Review for courtesy of publication of Dr. Smith's paper and generously loaning electrotypes for purpose of illustration.—Editor.)

(Continued from November Issue.)

### INTRA-ORAL NERVE BLOCKING OF ANTERIOR SUPERIOR ALVEOLAR AND INFRA-ORBITAL NERVES.

I think I am safe in making the statement that more failures have followed the injection for these nerves than any other deep nerve blocking injections. I have had numerous dentists tell me that their results had not been highly satisfactory following their injection. It has been my pleasure to examine a large number of skulls in the various colleges, also cadavers and I have found in nearly every instance that if a line is drawn through the long axis of the second bicuspid tooth that this line will pass through the infra-orbital foramen. If the patient looks directly forward this line will also pass through the pupil of the eye. This has given me a key which has proven of much value in the technique of blocking the above named nerves. To follow this technique it is self evident that the patient must have normal occlusion, or at least the upper second bicuspid must be in its normal location. The technique I employ is as follows: Stand in front of the patient. Locate the infra-orbital margin with the left index finger. After the infra-orbital margin has been located bring the finger downward approximately 10 millimeters and hold same in this area during injection. The infra-orbital foramen is located 10 millimeters below the infra-orbital



margin in most cases. Have your patient look directly forward and observe that your index finger is directly beneath the pupil of the patient's eye. Draw an imaginary line from the pupil of the eye through the long axis of the second bicuspid tooth and the line will pass through the infra-orbital foramen. While your index finger is resting over the foramen lift the upper lip with the thumb, thus exposing the tissue in the region of the bicuspid. Insert the needle into the mucous membrane on the buccal side of the second bicuspid at a point where the cheek blends with the gum tissue. Carry the



FIG. 20.

The above photo shows the branches of the infra-orbital nerve supply exposed, also the infra-orbital foramen. Note the needle is parallel to the long axis of the second bicuspid tooth.

needle upward, directing it at a point beneath the index finger. Be very careful to have the needle parallel with the second bicuspid (provided patient has normal occlusion), as it will give you an excellent guide in locating the infra-orbital nerve. Do not come in contact with the periosteum except at the time the point of the needle strikes the region in or near the foramen. Inject 2 c. c. of the solution. After a few minims of the solution have been injected you can readily detect the presence of the point of the needle and it will assist you in determining whether or not you have the needle in the right location. After the solution has been injected, gently massage



the skin over the injected area, thus forcing the solution into the infra-orbital canal. This will anesthetize the anterior-superior alveolar nerve, which is given off from the maxillary division of the fifth nerve in the infra-orbital canal approximately 5 millimeters posterior to the infra-orbital foramen. The success of this injection depends upon the solution reaching this nerve (anterior-superior alveolar). The anterior-superior alveolar nerve supplies the upper central, lateral and cuspid teeth, also anastomosing with the dental plexus located over the bicuspid and with its fellow on the opposite



FIG. 21.

Infraorbital Injection. Correct position of syringe for blocking anterior superior alveolar nerve, infra-orbital nerve and their terminations. Needle parallel with long axis of second bicuspid.

side. Therefore, if you require anesthesia of the central, lateral and cuspid teeth it will be necessary for you to block distal to the cuspid and distal to the central in order to block the nerve supply from the other branches. The needle used in this injection is 30 millimeters in length and 24 gauge. The time to wait for anesthesia is approximately 10 minutes. If you desire to remove these teeth, block the nerve on the lingual side.

#### BLOCKING THE ANTERIOR PALATINE NERVE.

This nerve enters the surface of the hard palate through the



posterior palatine foramen. The posterior palatine foramen is located in most individuals midway between the lingual gingival margin of the upper second or third molar (depending on whether the patient is an adult or child) and the median line. In other words, it is located about 15 millimeters from the lingual gingival margin toward the median line. The anterior palatine nerve passes anteriorly along the apices of the lingual roots of the upper molars and anastomoses with the naso-palatine nerve on the lingual surface of the cuspid tooth. The technique used for this injection is as follows:



FIG. 22.

Upper section of wet anatomical specimen showing termination of Infra-orbital Nerve and needle in its correct position for blocking this nerve and the Anterior Superior Alveolar Nerve.

Pierce the mucous membrane directly over the foramen, holding your syringe across the mouth, allowing the barrel to rest upon the lower bicuspid on the opposite side. Pierce the tissue at a right angle. Insert the needle approximately 10 millimeters. Inject 7 or 8 minims of the solution. The time to wait for anesthesia is from two or three minutes. You will find you have secured anesthesia, if the injection has been properly made, as far anteriorly as the distal surface of the cuspid on the lingual side. The needle used for this injection is the same as for the infra-orbital injection.



## INTRA-OSSEOUS ANESTHESIA.

This form of anesthesia has been used for a number of years and it has proven in the hands of some operators to be very valuable while in the hands of others it has not proven of great success and has been discarded, due to the fact that in most cases the technique employed for this particular branch of anesthesia was not carried out to an extent to produce good results. I have already spoken about the nerve supply of the two superior bicuspids and first molar. It is well, however, to again state that these three teeth are supplied by the middle-superior alveolar nerve, which is situated beneath the surface of the superior maxillary bone. It is impossible to reach this nerve with the needle. It communicates with the posterior and anterior-superior alveolar nerves thus forming the dental

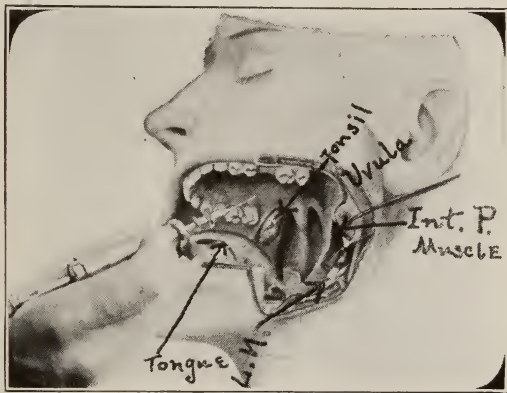


FIG. 23.

This illustrates position of needle for blocking the anterior palatine nerve as it emerges from the posterior palatine foramen.

plexus. I am frank in making the statement that I have experienced more failures following the injection for blocking the nerve supply to these teeth than any other nerve blocking injection. This is contributed to by the fact that the nerves are located beneath the surface of the bone and when terminal or infiltration anesthesia was employed it was necessary for the solution to penetrate the various structures in order to produce anesthesia. Terminal or infiltration anesthesia in my hands for the blocking of these teeth has not been very satisfactory. It is true that excellent results can be secured from infiltration anesthesia in a young subject but in middle aged or elderly people the external alveolar plate is so dense it is impossible for the solution to infiltrate through it in many cases. Many dentists state the same results as I have experienced. Following infiltration anesthesia, it has not been possible for me to remove



pulps or perform an apicoectomy without inflicting pain in many cases. Following so many failures from infiltration anesthesia, I sought another method for blocking this zone which has not only proven very satisfactory for other areas. Dr. Otte was probably the first man to use and introduce intra-osseous anesthesia to the profession and it was used considerably, but due to not having a well defined technique it has been discarded by many operators. Nogue called the method "Anesthesie diploique." It has been my pleasure to work out a technique which has proven highly satisfactory in my hands as well as many other opera-



FIG. 24.

This illustrates the double bladed lancet and intra osseous guide in correct position for blocking the zone in the region of the two superior bicuspids and first molar.

tors. We are all acquainted with the technique employed in years gone by which consisted of drilling an opening through the external alveolar plate with a drill or burr. This opening was not only made through the plate of bone but caused considerable laceration of the soft tissues and periosteum. Following this procedure the blunt needle was employed which was inserted into the opening and the solution injected. Many times it was impossible to find the opening with the needle and it then became necessary to enlarge it. There was no contact between the needle and the bone, which allowed the solution to flow back around the needle and it was impossible to know how much solution was injected. This was not the only fault



experienced, but the laceration of tissue and the chance of infection was always present. The new technique for this particular work is briefly as follows: The teeth and alveolar process is divided up into various zones which makes it a very easy procedure for the operator. The needle is inserted above and between the apices of the roots of the teeth. The mucous fold is thoroughly dried and the antiseptic solution applied. A double bladed lancet retractor and intra-osseous guide are employed in making the injections. The lancet has two very small blades which are located a short distance apart. This instrument is held in the hand and the two blades are held to-



FIG. 25.

Showing the intra osseous guide in position and the bi-level drill in use.

gether by the thumb and index finger, thus making one cutting edge. This instrument is now forced through the mucous fold which has been prepared with the germicide solution and by injecting a few minims of the anesthetizing solution which eliminates all pain caused by the lancet. The small blades which are in contact are forced through the tissue until they strike the external alveolar plate, and at this time the tension is released and the blades are allowed to separate, which separation is gauged on the instrument. This prevents all laceration and protects the tissues. While this



instrument is in place the intra-osseous guide is forced down between the blades until it rests upon the bone. The lancet is now removed and the guide remains in position which is ready to receive the drill. The templet part of the guide is 7 millimeters long and is held at right angles to the surface of the bone. The drill is next employed which is bi-bevel in shape and is very small. It is a fraction smaller than the needle which follows this particular phase. The needle is blunt and 10 millimeters in length. It is forced



FIG. 26.

This illustrates a practical case for blocking the two superior bicuspid and first molar by the intra osseous method.

through the templet and by a little rotating movement it is forced into the opening made by the drill which is a fraction smaller. The needle being 3 millimeters longer than the templet gives perfect contact between the needle and the bone. The solution is now injected and the amount of solution depends upon the size of the area to be blocked. The needle is now withdrawn, the templet removed, the tissues allowed to come together and the germicidal solution is applied to the area. It is impossible in most cases to detect where the solution has been injected because there has been absolutely no



laceration. The advantages of this method are no laceration of tissue, a definite amount of solution is injected, perfect and quick anesthesia is obtained, no back flow of solution, and the elimination to a great extent of any post-operative infection as was experienced many times heretofore.

#### EXTRA-ORAL NERVE BLOCKING FOR ORAL SURGERY.

This method is to be employed when the intra-oral method is contra-indicated. In nearly all operative cases the nerve branches



FIG. 27.

Note the intra osseous guide in position and the needle being forced through same. The solution is now ready to be injected.

can be blocked by the intra-oral method; however, the intra-oral method is not the method of choice under certain prevailing conditions. The extra-oral method should be employed in those cases where pus or a great amount of inflammation is present within the oral cavity, or in cases of impacted third molar of the third degree type, accompanied by pus, inflammation and trismus. The extra-oral method is of great advantage in cases of fracture of either jaw which is accompanied by tenderness and swelling; also, in antrum operations, removal of tumors, as well as any other pathological condition in which the operator deems the intra-oral method



contra-indicated. Braun was one of the first to present extra-oral anesthesia; however, it has not been employed to any extent until recently for oral and dental surgery. It has been the writer's experience to carry out considerable research work on cadavers, and has demonstrated the technique for extra-oral injections and anatomical specimens, as well as making a large number of injections on patients in the clinic. I trust the simplified technique presented here



FIG. 28.

The arrow to the extreme right indicates area of anesthesia produced following the tuberosity injection. The "X" shows point of intra osseous injection, and the left arrow indicates anesthesia obtained to the median line; while the middle arrow indicates anesthesia in opposite direction, thus joining the area anesthetized by the tuberosity injection.

for extra-oral as well as intra-oral methods will prove of value in oral surgery and to general practitioners. It has been my aim in all technique worked out to make it simple and practical, combining efficiency with ease in executing any injection.

#### EXTRA-ORAL BLOCKING FOR THE INFERIOR MAXILLARY OR THIRD DIVISION OF THE FIFTH NERVE.

The skin through which the needle is to be inserted must be thoroughly prepared. The part must be thoroughly cleansed and followed with an application of bichlorid solution or tincture of iodine. Make an initial injection into the skin with a fine, sharp needle in order to eliminate the pain which would be caused by the regular needle for the deep injections. After this initial injection



has been made the long needle is used, which is 23 gauge and 5 cm. long.

The following technic is employed. Have patient open and close mouth slightly. Locate the space between the lower portion of the zygomatic arch and the upper portion of the ascending ramus, between the coronoid process and the condyle of the mandible. The following landmarks are carefully followed. Before the skin is

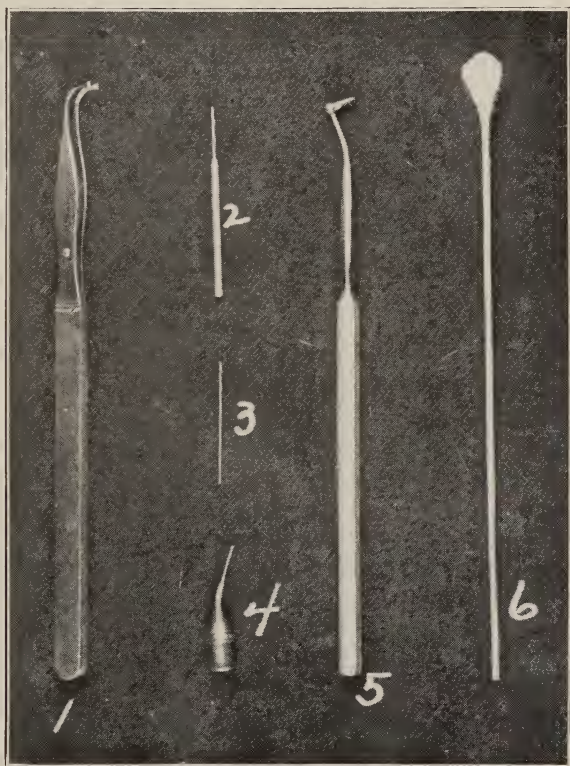


FIG. 29.

This illustrates appliances for producing intra osseous anesthesia. No. 1, the double bladed lancet and retractor. No. 2, the small bi-level drill of known length. No. 3, extra drill. No. 4, platinum iridium needle. No. 5, intra osseous guide. No. 6, wooden applicator for applying antiseptic solution.

prepared draw a line parallel to the lower margin of the zygomatic arch directly above the sigmoid notch on the mandible. Connect the two ends of this line by following the lower border of the sigmoid notch. This will give a semi-circle and indicates the location of the sigmoid space. Puncture the skin with the needle in the center of this area, allowing the needle to form a right angle with surface of skin. Now direct the needle inward to a depth of 4 cm.



which is the average distance in most cases. The point of the needle should be one centimeter anterior and inferior to the foramen ovale which transmits the third division of the fifth nerve. Inject 3 c. c. of the solution. Anesthesia of the lower jaw on side injected should occur in from 7 to 15 minutes.



FIG. 30.

Note position of the syringe for blocking the third division of the fifth nerve at a point one centimeter anterior and inferior to the foramen ovale. The needle is held at right angles to the skin surface.

#### EXTRA-ORAL METHOD FOR BLOCKING THE SUPERIOR MAXILLARY OR SECOND DIVISION OF THE FIFTH NERVE.

The blocking of the superior maxillary division of the fifth nerve in the spheno-maxillary fossa is as easily accomplished as the blocking of the third division. First locate the anterior surface of the ascending ramus and the anterior margin of the coronoid process of the mandible. Next locate the lower margin of the zygomatic arch in this region. Now draw a line along the lower margin parallel to the zygomatic arch. Next draw a line parallel and anterior to the coronoid process of the mandible, which is in a perpendicular position. A right angle is now formed. Now connect these two



lines with another line thus forming a triangle. After the skin has been treated aseptically, a puncture is made with a fine needle in center of triangle for the initial injection. Then use the same needle as is used for blocking the third division. Direct the needle backwards, inward and upward for a depth of 2 cm. In the average case the point of the needle should strike the periosteum covering the posterior lateral tuberosity of the superior maxillary bone. At this point is located the posterior-superior alveolar foramen con-

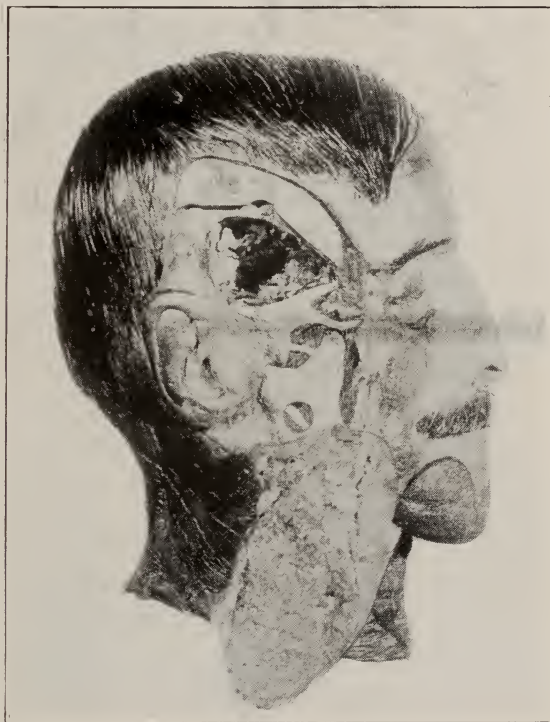


FIG. 31.

Note the first, second and third division of the fifth nerve.

taining the posterior-superior alveolar nerve. The point of the needle strikes the periosteum thus indicating the needle is going in the right direction. Force the needle past the tuberosity 20 more mm.

The point of the needle should then enter the region of the second division of the fifth nerve within the spheno-maxillary fossa. The point of the needle should be located just posterior to the posterior-inferior margin of the orbital cavity while the solution is being injected. Inject three cubic centimeters. The depth of the needle in the average adult case is four centimeters. The needle should be



five centimeters in length. Anesthesia is secured in most cases in from five to fifteen minutes. The structures anesthetized include the following: All structures supplied by the second division of the fifth nerve such as the superior maxillary bone, teeth, antrum, gum tissue, portion of cheek, periosteum and half of palate, etc.

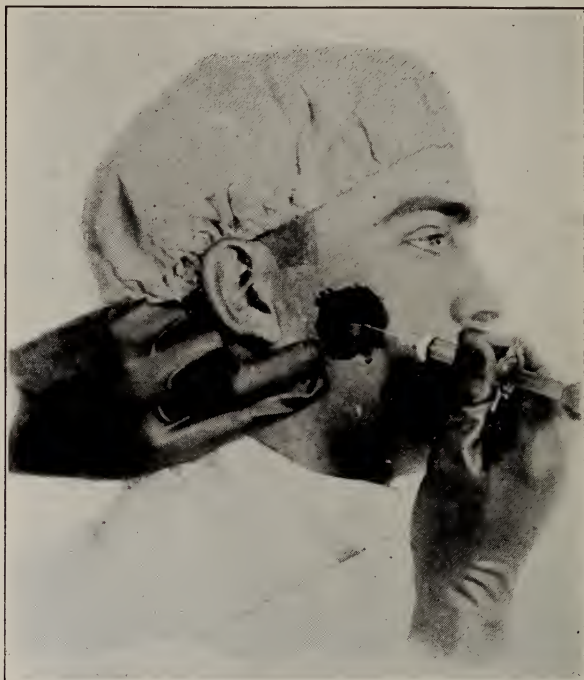


FIG. 32.

Extra oral method for blocking superior maxillary division of fifth nerve. The needle is directed backward, inward and upward until it reaches an area anterior to the foramen rotundum.

#### EXTRA-ORAL METHOD FOR BLOCKING THE INFRA-ORBITAL AND ANTERIOR SUPERIOR ALVEOLAR NERVES.

Locate the infra-orbital foramen with the index finger, then bring it down, allowing it to rest directly over the foramen which is located at a point 1 centimeter beneath the infra-orbital margin. Use a fine sharp needle as described heretofore for the initial injection. Now follow the initial injection with the regular needle which is of iridio-platinum, 24 gauge and 3 centimeters long. The injecting needle is now forced upward and backward to a depth of 1 centimeter in the majority of cases. Inject 2 c. c. of the solution at the opening of the infra-orbital foramen. Next massage the skin directly over the area injected, thus forcing the solution backward into the



infra-orbital canal to a distance of 5 mm. in most cases, thus allowing the solution to come in contact with the anterior-superior alveolar nerve. Anesthesia is secured in the following structures in less than 5 minutes: Central, lateral and cuspid teeth, side of nose, upper lip, alveolar process, labial tissue, anterior wall of antrum, and periosteum providing the anastomoses are blocked on the opposite side of the median line and of the middle-superior alveolar nerve branch.

#### EXTENT OF APPLICATION.

Local anesthesia may be employed for any operation around the

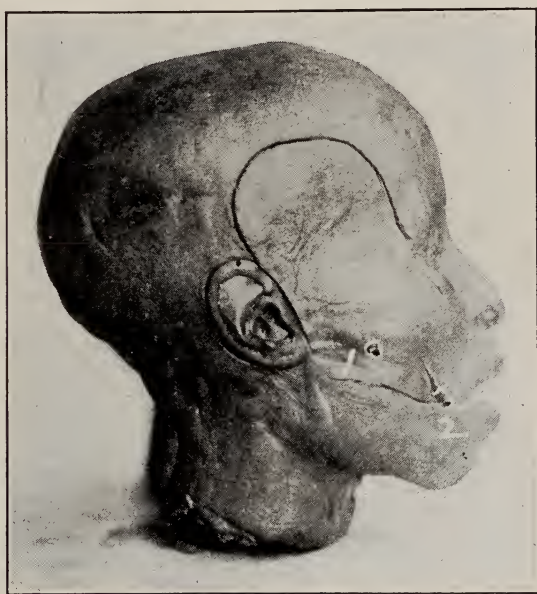


FIG. 33.

Wet specimen which has been prepared to show important structures located in the speno-maxillary fossa. Needle No. 1 shows position for blocking the third division. Needle No. 2 for the second division.

face or about the jaws provided the operator understands his anatomy and is careful and exacting in his technique. It is absolutely necessary for the operator to know what nerves are to be blocked and how extensive an area of anesthesia must be produced in order to operate without inflicting any pain during the operation. If the operation is for the removal of a malignant growth or even a benign condition or the curetting of necrosed bone or treatment of empyema of the antrum, local anesthesia has an advantage over a general anesthetic for the reason that in most cases the patient will consent



to an earlier operation. Last but not least one may add that nerve blocking anesthesia renders the area of operation less bloody and the operator is not handicapped by a general anesthetic mask. Many anesthetists and oral surgeons who have familiarized themselves with this method of anesthesia state that it has many advantages over general anesthesia in the majority of cases. However the operator must carefully select between general and local anesthesia and never be too hasty in his decision. Local anesthesia has its contraindications, so does general anesthesia, so the dentist who masters the technique for both methods can render better service than to simply apply any single method.

#### NERVE BLOCKING ANESTHESIA FOR TONSILLECTOMY.

During the past few years I have spent considerable time in working out a nerve blocking technique for the removal of the tonsils. My findings along this line have been very satisfactory and it gives me great pleasure in presenting this technique to the eye, ear, nose and throat specialist. We are well aware of the fact that the medical man has not followed a definite system in injecting the solution. He has injected the solution promiscuously into the pillars of the tonsil and tonsillar tissue and in many cases the tissue has been in a state of degeneration, containing pus and necrotic material. We are aware of the fact that when solution is injected into tissue of this character there is great danger of disseminating infection and carrying infected material into healthy tissue. I am quite sure that no learned dentist would be guilty of injecting solution into inflamed tissue or an alveolar abscess. It is impossible for me to give the detailed technique for blocking the tonsils by the deep nerve blocking method but I will attempt to give the nervous anatomy and a brief outline of the technique. The tonsil derives its nerve supply from two different sources. Its principal nerve supply comes through the branch of the glosso-pharyngeal which unites with the branches from the pharyngeal plexus, thus forming the tonsillar plexus which is located at a point posterior lateral to the base of the tonsil. The second supply is from Meckel's ganglion which is located in the sphenomaxillary fossa, which gives off a number of branches. The branches which interest us just now are the nasal, pharyngeal, nasopalatine, anterior, middle and posterior palatine. The anterior palatine passes through the posterior palatine foramen and supplies the tissues in the soft and hard palate communicating with the nasopalatine branch which passes through the anterior palatine thus forming the inner nerve loop. The middle palatine nerve is distributed to the mucous membrane of the soft palate, uvula, and palatine tonsil. The posterior palatine branch supplies the mucous membrane of the tonsil, soft palate, uvula and a portion of the pillars. The technique for blocking the tonsil is as follows: The



plexus tonsillaris and the pharyngeal plexus are located posterior and lateral to the base of the tonsil. These structures are blocked by inserting the needle midway between the occlusal surfaces of the upper and lower teeth, puncturing the mucous membrane at the base of the tonsil beneath the plica semilunaris and directing the needle backward and laterally to a depth of approximately 2 cm. 2 cubic centimeters of the solution is injected. The other nerve supply of the tonsil which is from branches of Meckel's ganglion is blocked in the same manner as given above in the technic of block-



FIG. 34.

This illustrates the blocking of the palpebral, nasal, labial, and anterior superior alveolar nerves which are branches of the infra-orbital nerve, by the extra oral method.

ing the second division of the fifth nerve by the intra-oral method, with the exception that the needle is not forced in to the depth of 3 cm. but 2 centimeters in the average case, thereby anesthetizing the palatine branches which are located in the speno-maxillary fossa. We are aware that it is difficult to carry out the technic on a very young person unless the operator can obtain and maintain the confidence of his little patient. In my opinion this method proves of exceptional value for the removal of tonsils and will prove of great advantage in many cases over general anesthesia.

As stated at the beginning of my lecture this evening, it is abso-



lutely impossible to cover only a small number of injections and even those I have covered very briefly. The subject of nerve blocking is a broad one and considerable time must be given in order to cover the subject in detail.

In conclusion allow me to say that there has been no discovery or method used in the practice of dentistry for the purpose of enabling us to do better work resulting in more satisfied and grateful patients than that accomplished through the medium of the relief of pain. The progress of dental science has been wonderful during the past ten years, and it is gratifying, I know, to every member of our profession to see what has been done in research work in all its phases, and to my mind the relief of pain is appreciated most of all by the patient; the proof of this statement is manifested by the enthusiasm of the patients who have been operated upon and who go on their way rejoicing, praising the dentist who rendered them such service. The dentist who familiarizes himself and becomes proficient in the relief of pain and who gives his patients the benefit of his knowledge is the one whose services will be a pleasure—and his patients will speak more words of praise and commendation for him; he will be enabled to render his patients a higher professional service, and will not be handicapped in his operations.

The immediate field of operation that the dentist is called upon to treat is supplied by the fifth pair of cranial nerves; perhaps the most sensitive of the human body; especially is this true regarding pain, which is the only sensation conveyed by the dental pulp.

We are living in a time when the public demands services with the least amount of pain. Therefore, it is the duty of every dentist to study and apply that which the science of medicine and chemistry offer. The day of the practitioner who contends that a light touch and a sharp bur is all that is necessary in modern practice is rapidly passing, and all antiquated methods and ideas will be in the archives of discarded things, and he will have to grasp the tool of efficiency and travel with the modern trend. It is self-evident that an operator can render better service when the patient is free from pain, as he can better remove the decayed dentin and prepare cavities scientifically.

When service can be successfully and painlessly rendered without endangering the health of the patient, it is always advisable; for any agent that has for its object the relief of pain is worthy of our earnest consideration and study.

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CONSIDERATION FOR THE PATIENT.—After removing the rubber dam apply a little tincture of aconite and iodine to the gums. This will serve in a measure to ameliorate that "used up" feeling of the mouth which so often follows oral manipulations.



# Physical and Laboratory Diagnosis for Dentists\*

EDWARD H. HATTON, D.D.S., CHICAGO.

PHYSICAL diagnosis is not a new thing now, nor an unknown subject in the training of dentists, but it is not proper to say that it is a universally accepted procedure. In the summary of the courses offered in a number of dental schools in America, published in the proceedings of the American Institute of Dental Teachers in 1917 (No. 1), 29 schools offer courses in physical diagnosis and 17 do not. The amount of the time allotted, varies from 16 to 32 hours and the character of the courses is not stated. In going over a number of school catalogues, the most complete statement is that found in the Harvard programme, (that is possibly, aside from those schools represented here to-night), and is as follows:—

“The course includes methods of inspection, percussion and auscultation of the patients, supplemented by an examination of the blood pressure. It enables the student to distinguish such cases of the heart as would be unsafe to subject to the shock of surgical procedures or anesthesia.”

It is given in the fourth year and in small sections, but the amount of time devoted to it is not stated.

In another school I have reason to know that a course is given wholly by lecture, without any practical experience with either the stethoscope, the blood pressure apparatus, or any other instrument of precision. In none of the schools, as far as I know, is there any attempt to give anything resembling what the medical schools call laboratory diagnosis, although in various scientific courses, especially bacteriology and pathology, there is laid the ground work for such a course.

No one contribution to the practice of dentistry and medicine has turned the attention of people in general more to the teeth and investing tissue than that of the theory of focal infection. This operates in two ways: In the first place, it increases the responsibility of the dentist, and therefore, in the second place it invests his profession with a new dignity and a rating higher than formerly assigned to it. Greater things are expected of the practice of dentistry than merely the maintenance of the masticating machine, or in a common phrase “running a mouth repair shop.” Brown addressing the Ohio Medical Society on the responsibility of the dentist in preventive medicine, made the following statements:—

The dentist of his own initiative should do everything possible to correct conditions which would in any way make it possible for a focus of infection to develop in his immediate field of operation.

(No. 1). Proceedings of the Twenty-Fourth Annual Meeting of the American Institute of Dental Teachers, Buffalo, 1917.

\*Read before Toronto Dental Society, November 4, 1918.



Further, when called into consultation with the physician or any specialist in medicine, he should co-operate to the end that oral infection might be eliminated at the earliest possible moment. . . . Our energies must be expended in a constructive and progressive way, which will result in the greatest benefit for the largest number."

This is from a physician. It means that no dentist is a mere craftsman and that in his association with individuals practising the sister profession of medicine and surgery he is greeted as an equal, both in so far as his branch contributes to the general welfare of the body, and in so far as his opinion is courted and desired. *Indeed, there is an apparent tendency to recognize dentistry rather as a specialty of the great field of medicine.*

With this broadening of the field, there is a tendency to hold the dentist more and more responsible for methods and information, that formerly were more or less exclusively those of the physician. To a certain extent, this is more true in the field of diagnosis than in any other branch, and it is to this field that I am going to limit my scrutiny to-night. I am going to be concerned with the reasons why dentists should be familiar with diagnostic procedures and not only that, but with their actual performance in certain cases.

There are a number of factors that thrust this matter of physical and laboratory diagnosis onto the dentist, and they are as follows:

First, the matter of anesthesia. No anesthesia, even that of a local one, is without some danger, and that danger is materially increased in certain forms of physical disability. As dentists, we are now much interested in avoiding untoward results in our anesthesia, and complete and ultimate success in this proposition is dependent on information that can only be gotten by some form of physical or laboratory examination.

In the second place, as I have already suggested in the preceding statements, the relationship of mouth infections to disease elsewhere in the body, has sharpened our interest in disease manifestations outside of the mouth. In spite of himself, the dentist is obliged to take an interest in what is going on in the organs and tissues of the body in general. To do this properly, he is dependent on the methods of physical and laboratory diagnosis.

The third reason results from the preceding two. Let us call it the medico-legal relationship of the dentist. We are facing new social and legal institutions that have to do with a multitude of factors, such as workmen's compensation acts, many forms of accident and health insurance, school inspections, and preventive medicine and dentistry. As a result of the theories of the relationship of mouth infections to disease elsewhere in the body, dentists' examinations and the records that are kept of them, are of prime importance in the settlement of such cases.

It seems probable from the inventories of our manhood popula-



tion between the ages of eighteen and forty-five—(and this inventory the result of physical examinations)—that there will be some definite, concrete, and systematized effort made to rehabilitate and reconstruct the very large group defectives.

In the fourth place, dentists are being more and more called into consultation with internal medicine men and other specialists in the so-called group study of cases by which it is expected to arrive at a more refined diagnosis and outline a more satisfactory and scientific course of treatment. Dentists are functioning in these groups, and they are concerned both with the problems of diagnosis and treatment. It seems very probable, therefore, that group study of disease for these purposes is going to increase rather than decrease. There has been such a clinic at the Massachusetts General Hospital for the last three years. There are two well-known clinics in California, and presumably many others. Not only in these formal groups, but in the more or less informal groups, dentists are playing important parts. The San Diego Group, in reporting its first 200 cases, made this statement about mouth and throat conditions:—

"Abnormalities of the mouth, throat, and nose were so almost universally present, we have not attempted to classify them. . . . Practically all mouths from which the teeth had not been entirely removed, contained one or more roots upon which the X-ray looked with suspicion. While these conditions rarely furnished sufficient explanation of the complaint of the patient, it is interesting to note how frequently improvement commenced after treatment was inaugurated by the removal of teeth or tonsils."

In the fifth place, the present war is a large factor, but it is hard to determine just how and where it belongs. It is possible to say, that large numbers of our young men have had experiences and contacts that will influence all professions and all forms of legal and social activity to unknown degrees for years to come. Medically and surgically (and this includes dentistry), they have seen and in a large number of cases have actually experienced the beneficent results of various forms of professional co-operation and activity. Hospitals, infirmaries and dental practices of the highest types are familiar to them. They will undoubtedly attempt to "carry on" in civil life such activities as seem to them worth while. They will have become familiar with many of the commonly accepted examinations, medical tests and dental procedures.

Their standard will be more or less fixed by what they have seen and experienced during these new contacts.

I am convinced that a dentist must be pretty familiar with the methods of physical examination in general use in order to do his part in this great work to his greatest advantage. Some he should know how to perform, others he should know the interpretation but not the details of the performance; there is a third group which he



should understand in a general way, and finally a fourth about which he need be concerned not at all.

At the time of the first presentation of the patient, not only should an exact examination of the conditions existing in the mouth be made, but this should be spread to a general estimate of the individual. Any apparent deviation from the normal in these general respects should have rather careful attention, and if possible, related to the mouth conditions found. Apparently Barker's classification of the items that are to be included in such an examination are more than sufficient, and it follows:—

1. Body temperature, pulse rate at both wrists, respiration.
2. Height, weight, relation to average calculated weight, nutrition, musculature.
3. Posture, gait, behavior.
4. Skin.
5. Hypertrophied glands, bones, joints, muscles.
6. Blood pressure.

Except item No. 6, these are the ones that are familiar to all of us, whether professional or laymen, and very nearly correspond in many points to those covered by the army examinations. There are three things I should like to emphasize, for I believe a careful record of them concerns the work of dentists. The first one is temperature, the second is nutrition, and the third is pulse rate. The reason for the first two are obvious. There is always a possible connection between temperature and some dental condition, and this is also true of nutrition. Recently in examining young men of draft age, I have been astonished at the large number of rapid pulses. There was only one other factor that presented itself with the same regularity, the equally striking number of defective teeth. Of course, it is pushing the mere fact of coincidence pretty hard to say that there is here any relationship of cause and effect. There are other factors to exclude first, but even after those of excitement, the influence of tobacco and such intoxicants as goiter are ruled out, there is remaining a very considerable number still unaccounted for, and which have been allowed to go to the cantonments for the army surgeons to dispose of as they see fit. These men belong to a group known as "Irritable hearts." Occasionally they have been discussed under the heading of "Soldier's Heart, or Irritable Heart of Soldiers." This rather large group concerns dentists because it has been found repeatedly and by repeatedly I mean by many observers at different stations, that such hearts are in a large number of cases susceptible to a treatment that consists of just two things:

1. The removal of a focus of infection, possibly about the mouth and teeth.
  2. Graded exercises.
- My point is, that whatever dentist will take the trouble to follow



out this matter of pulse in his own practice, he is bound to make some just as interesting discoveries, and possibly, effect just as wonderful cures. And, no doubt, members of this audience have accomplished just this, but have you records to show it? Don't think that I am trying to impress on you the necessity of a routine of taking pulses, heights, and all that religiously in every case, nor do I mean to advise anyone to take an unduly extended time in making physical examinations; such a practice would be absurd and leave no time for operative work, but, let nothing of importance be overlooked.

Blood pressure is a measurement that can be taken easily and should be a familiar technique of dental offices. It offers information of two classes of cases. One group is covered by the pre-anesthetic pre-operative use of this test. The other is a means of verifying a possible effect of focal infection.

I have a double pleasure, if you choose to call it that. Not only the opportunity for making mistakes of my own, but to see and investigate the mistakes of others, and many of them concern deaths during or the result of anesthesia. I can't help having a feeling that many of these deaths are avoidable affairs, but their avoidance is a rigid prophylaxis. This includes many factors that are outside of this paper, those that are within it have to do with the use of the blood pressure apparatus, the examination of the heart and of the urine as a preliminary to the administration of an anesthetic. I have come in contact with cases, where for the lack of observance or just such precautions, death has occurred, and it usually happens just in the case the operator most hates to lose. In the face of unfavorable findings in any of these tests, it seems unwise to trust an anesthesia except for a strictly life-saving operation.

The examination of the body may be divided into either regional or systemic groups. The examination of the various systems as such seems to be quite out of consideration except in so far as it concerns the respective specialities. On this account for our purpose, the regional division is much more satisfactory. The examination of the head region should be thoroughly comprehended by the dentist, for this includes his chosen field and the region just adjacent to it. He should not be held responsible for the examination of the special senses nor of the nervous system. But the conditions of the adjacent structures, the tonsils, the glands of the neck, the tongue, the accessory sinuses of the skull bones, all have some possible connection with his work. This includes such special methods as transillumination and the use of simple electrical apparatus.

The examination of the chest region holds two points of interest,—the heart and the lungs, especially the former. I am sure that it is not fair to expect that a dentist will become an expert in the use of a stethoscope, so as to distinguish the finer chest sounds or that he



will be able to percuss with any great ability, but I do believe that he can locate the apex beat and that he can learn to distinguish between the sounds that are certainly those of a normal acting heart and those of one that is the seat of some unusual condition. Then, having gone so far as to determine the existence of a possible diseased heart, he can insist that his patient have a physician's examination and recommendation before being allowed to submit to an anesthesia or to the removal of a large number of teeth; or in an elderly person or invalid to the removal of even a single one.

It is undoubtedly true that many important evidences of diseased hearts and lungs are found elsewhere in the body, than in the chest, and these evidences should give great weight in the classification of the character of the risk involved.

They have been mentioned above and are alterations of the character and rate of the pulse and respiration, and then the relationship to exercise or exertion; the color of the skin, swellings of the ankles, enlargement or displacement of the liver are suggestive. The relation of weight to the average calculated weight; and weight changes (either recent losses or gains) and the condition of nutrition, are equally important.

So far we have been concerned with examinations that can be made by the dentist. Now comes a group that dentists should have made from time to time, but need not be able to perform for themselves. They are for the most part, those examinations that are made as a routine in cases that come to the diagnostic clinics or groups already spoken of. They are:—

Blood examinations, including red and white cell counts, haemoglobin, differential counts, the detection of parasites, and the Wasserman test, or other complement deviation tests. Sputum examinations, especially for tuberculosis. Stomach examinations, especially test meals. Examinations of the feces, especially for undigested food, and occult blood, eggs and parasites. Urine examinations.

Of these the blood counts and the urine examinations are by far the most valuable. I have been watching a series of blood counts in dental cases with a critical interest. Apparently the white cell count indicates conditions somewhat similar to those measured by the temperature, but the result is a complementary one, rather than a parallel one. By that I mean, that there is frequently an increase in the white count without an increase in temperature or vice-versa. There are three rather surprising facts concerning these blood cell counts in dental cases, that is, surprising because my preconceived notions were incorrect. Rather extensive dental infection does occur without any radical reduction of the red cell count, and without any noteworthy reduction of the haemoglobin percentage, and often without any marked increase in the white cell count. A moderate increase of the white count is, however, quite uniformly found in



chronic infections, and high white cell count in acute pyogenic infections. In the swellings about the mouth the white cell count is a valuable adjunct in reaching a diagnosis.

In purely dental cases, I believe there is very little temptation to have blood taken for the Wasserman tests or other complement deviation reactions. On the other hand, the cases that are to be seen in consultation will or should have had such tests made. Such a test offers such valuable information that it should not be neglected in any case that comes for diagnosis presenting a more or less involved problem. There has been some considerable recent discussion as to the validity of the Wasserman test for syphilis, but the general impression now is that it is a highly valuable contribution to diagnosis if the laboratory findings are interpreted with a due regard to the clinical picture. A positive test is of greater significance than a negative one. Of all those infected with syphilis, there are a small number that fail to give a positive test with the blood serum. These may reach as high as 8 to 10 per cent, or with some serologists even higher.

The actual performance of these laboratory tests is a matter of technical skill that can be mastered by a laboratory technician, who need be neither a physician or a dentist. Often nurses make very capable technicians, and do the work even more faithfully and conscientiously than their professional teachers. They cannot interpret the tests, but that is an advantage. It is therefore possible to make one laboratory supply a considerable group of men both dentists and physicians, a laboratory that will do a large amount of work, reliably and at a rather small expense, provided there is at least one individual member of the group capable of training and supervising the technical assistant.

The advantages of such a laboratory, especially over the ordinary commercial laboratory are numerous, and are as follows:—

1. The length of time elapsing between the removal of the specimen and the start of the laboratory manipulation is reduced to the minimum. This is highly important, especially in perishable material, and this concerns all bacteriological specimens, pus for autogenous vaccines and urines.

2. The laboratory staff can have some supervision over the taking of specimens. By this, one mistake frequently made by the operator and clinician in removing or taking a specimen can be avoided. It is so easy to take a piece of tissue or a specimen of pus, so that it is not representative of the condition existing in the patient.

3. The laboratory staff is kept in constant contact with the clinical facts. It must be conceded, and without qualification, that no laboratory report is absolutely final, without its careful analysis by some more or less impartial judge,—and that judge should be the clinician, provided only he is sufficiently broadminded to grasp all the factors



in the case. Such diagnosis is virtually a procedure similar in all respects to a legal trial,—and the patient's story (that is the history), the physical findings, and the laboratory reports, are all in the nature of evidence which should be carefully scrutinized by the old principles. (Do you recollect the familiar legal refrain "immaterial, irrelevant, unimportant?") Now isn't the clinician and his consultant, if there be any, after all, the judge and the jury? Diagnosis is not a problem in mathematics nor in pure logic, but is a problem of applied science and practice.

The making of vaccines is not properly speaking in the field of diagnosis, but belongs to the work of such a laboratory where the preparation of such a vaccine can be supervised by the clinicians. The curative properties of vaccines are being more or less questioned now, except in so far as the sure results from a violent systemic reaction, produced by the injection of the foreign protein, and it might as well have been some other vegetable protein, or even one of animal origin. But the preventive property of vaccines, it is conceded, is of the highest value, and is apparently specific, and a proper vaccine always involves a matter of diagnosis and selection of the organism. This then always includes matters that have been mentioned, and they are:—

- 1.—Proper choice of the material (pus).
- 2.—Proper choice of cultural methods.
- 3.—Proper choice of culture media in which to grow this organism.

This can only be secured by a very intimate co-operation between the laboratory and the clinician.

The laboratory is not a glorified God's heaven, nor the laboratory worker a superman, but there are, or should be, highly trained and capable technical assistants, or if you please, the very refined and amplified tools of the clinician.

It isn't for us to pass judgment on our own times. Life and the practice of dentistry are more complex now than in the days of our fathers and grandfathers. Whether we like them or not, I believe the times have come in which dentistry, either is, or soon will be, included as a specialty of the field of medicine, and dentists compelled to be familiar with phases of its practice. Of these no small item is that of physical and laboratory diagnosis, especially in so far as it concerns:—

- 1.—The estimation of the patient's condition of health as far as it concerns mouth conditions.
- 2.—The regional examination of the mouth and the adjacent structures.
- 3.—The use of certain laboratory and physical tests as a precautionary measure before operating or administering anesthetics.
- 4.—The intelligent interpretation of the routine laboratory tests used in medical diagnosis in order to co-operate to the best advantage when called in consultation with our medical colleagues.



## Discussion of Dr. Hatton's Paper

REPORTED BY H. A. MCKIM, D.D.S., TORONTO.

THE meeting of Toronto Dental Society November 4, 1918, proved to be a very happy occasion in the Society's history.

The attendance was perhaps a record one, and all expressed pleasure at the change of quarters. Moreover, the choice of essayist and his subject, "Physical and Laboratory Diagnosis," seems to have been very wise. If Dr. Hatton did nothing else he has arrested the interest of Toronto dentists to the need for greater and more intimate knowledge of the human body and the diseases to which it is a victim.

The essayist did not attempt to go into detail or conduct a clinic. He kept more to generalities. His purpose appeared to be the stimulating or creating a desire for a larger vision and larger place for dentistry among the specialized professions. In spite of himself the dentist is obliged to take an interest in what is going on in the tissues and organs of the body in general. Because of the relationship of mouth infections to disease elsewhere in the body our interest is sharpened in disease manifestations outside the mouth. More and more is the dentist called into consultation with the internal medicine man, and other specialists in the group study of cases by which it is expected to arrive at a more refined diagnosis and outline a more satisfactory and scientific course of treatment. Group study of disease is ever increasing, and the dental profession, whose field is of such importance, should be prepared to take its proper place in this consulting group.

This of course means ability to perform a physical diagnosis properly. It also makes necessary a definite understanding of methods in conducting a laboratory analysis or diagnosis. At least a man should be able to intelligently read a diagnostitian's chart and arrive at a proper conclusion. The essayist suggested the establishing of laboratories for group study and consultation under proper supervision. These were to be patronized by both physician and dentist. Thus the professions would be drawn much closer together. Indeed, more and more is dentistry being regarded as a specialized branch of medicine.

The discussion of the paper was opened by Dean Webster, who took the ground that whereas physical diagnosis and laboratory diagnosis were inter-dependent, yet they were clearly two distinct propositions. Dr. Hatton had given us an ideal, but is dentistry at present able to measure up? This would require a thorough knowledge of physiology, anatomy, pathology, biology, bacteriology, etc. In order to detect any abnormality one must be able to tell when an



organ is functioning normally. It is equally true that to detect disease one must be thoroughly conversant with symptomatology. A dental practitioner should recognize disease and understand it in order to trace its origin to any mouth infection. This would involve a great deal of time and preparation. Dentistry is a surgery.

However, every man in practice for any length of time is, or should be, a keen observer. He may not understand always, but he catches the irregularity. He could not make a laboratory diagnosis or analysis, nor could he conduct a physical diagnosis. However, Dean Webster would rather take the opinion of such a man re the patient's chances under an anesthetic than that of most highly skilled laboratory diagnosticians. Laboratory work is not infallible, and this is especially true of large laboratories. Radiographs are often mistaken or lead to very wrong conclusions.

The serious question is how far should a specialized profession go in general diagnosis? Every practice must be based on a thorough examination. Yet how far should the dental practitioner go in making the examination. The essayist says we as a profession should be able to discuss conditions as we meet them. That implies familiarity and thorough knowledge. Failing this we are on very dangerous ground. From observation Dean Webster feels that when in doubt the patient should be sent to the family physician for examination,

But why should the dental practitioner not have this knowledge? No dentist is a mere craftsman, and in his association with men practising medicine and surgery is more and more being understood as an equal. The efforts of all must be constructive and progressive to secure the greatest benefit to the greatest number. Dr. W. Mayo says that over 80 per cent. of all disease has its origin above the collar, and that well over 80 per cent. of this can be traced to the oral cavity. There is an ever growing tendency to more and more hold the dentist responsible for conditions in this field. Infection must be removed at the earliest possible moment. Other irregularities should be recognized and corrected without delay. Consult and co-operate with the family physician when doubtful. Thus the patient secures the best service, for after all he or she is the first factor for consideration.

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**TO PASS STRIP THROUGH A TIGHT CONTACT.**—When it is difficult to pass a finishing strip into the inter-proximal space on account of a tight contact point, sometimes it can be done by first passing a ligature to the tightest point. Then pass the strip down against it and carry both ligature and strip through.—*J. F. Nelson.*

**TO REPAIR A BROKEN FACING.**—If a facing breaks on a bridge do not remove the bridge but build a new facing with synthetic porcelain.—*J. W. Cormant.*



# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## EDUCATION AND EUGENICS.

THIS subject is a rather unusual choice for a dental journal. One is apt to suggest that there can be as little connection between dentistry and eugenics as there is between the average text and sermon. Sometimes we find, however, that very excellent sermons have poor texts. The unusual always holds our attention, so perhaps in this case something of more than passing interest may be gleaned.

It is a fact that we are always ready to support any measure having for its object the extension of dental or medical training and yet we do not pause sufficiently long to consider what results other than those educational a prolonged course may have upon the student's life. It is sufficient, we say, that he is well schooled for his work—such is the common view. But after all is not such an opinion a small one? Let us frankly face the facts. In early times—the period spoken of as the “birth of learning”—the scholar withdrew from the association of his fellows and devoted his time to study. He lived away from all that could be considered distracting, and concentrated his thoughts and energies to his chosen work. Marriage, home-life, family—all these things were not for him. He had no time for them. Such devotion to study was deemed necessary in early times. The modern idea is practically the same in so far as time required for study is concerned, but differs materially as regards the student's environments. Home and its many attractions are just as much for the professional man as for any other.

We have no fault to find with this viewpoint. The question is whether the dental or medical practitioners are deprived, by reason of their prolonged preliminary training, of the maximum enjoyments of home life. Investigators have abundant information to prove that college graduates, male and female, do very little towards reproducing the human race, as compared with others of lesser intellectual attainments. This brings us face to face with the whole question of eugenics.

In an editorial appearing in “The International Journal of Ortho-



dontia" (July, 1918) a few pointed statements are made regarding the question of college education and eugenics. The editor finds that "the number of children born to college men is very small as compared to those born to individuals who are not college educated. The majority of women who are college graduates also make very 'poor' mothers when judged by the number of children they rear." Such a statement would lead us to infer that higher education, which might reasonably be expected to aid the cause of eugenics, is in reality a hindrance. All of us are agreed that the best children ought to be those whose parents have had the advantage of higher education. Yet when we look about among college men and women we find an almost entire absence of children in their homes. At best the families are very small. This is indeed strange because it is a fact the bulk of the literature giving information as to the raising and training of children comes from these same college graduates.

One would naturally suppose that the parent who has had training along hygienic lines would be ideally qualified to rear children. We find, however, that medical men have the smallest families. In the editorial referred to above the whole situation is stated as follows: "The question of higher education and the question of eugenics for the improvement of the human race are working at variance with each other and as higher educational requirements are produced the number of children born to the college graduates is going to continue to decrease instead of increase. In other words, from that class of people who seem to be most suited to produce, so far as the improvement of the human race is concerned, we are going to have fewer and smaller families than we have had in times past. To state our subject more positively, we may say that the increased medical and dental course is a factor which is contrary to the laws of eugenics and which is going to do more in the future to decrease the number of children born to medical and dental men."

Take the situation as we now have it in medicine; a student must have, before entering upon his college work, a preliminary training, which is impossible to attainment before, say his eighteenth or nineteenth year. He is then expected to take a five years' course in medicine and if he has the misfortune to miss a term on account of ill-health or lack of finances, the time required may run into, say seven or even eight years.

Assume that he graduates at the age of twenty-five years. After graduating the young man desires one or two years' hospital training, and when this is complete he is nearing his thirtieth birthday. Deeming his training sufficient for his needs he then seeks to establish a home and commence practice. He has no money; indeed he is most likely in debt on account of the number of years of non-earning. With good luck and severe application to duties he may hope to pay off his debts and establish a professional connection in another five



years. We find him free of debt and with a home and practice established at thirty-five years of age. "Now," says our essayist, "by that time from a purely physiologic standpoint the individual has passed his most prolific years as regards the reproduction of the human race. It is a physiologic fact that the healthiest children are born from parents the father of which is between the age of twenty-one and twenty-eight. Those seem to be the years when the male of the human species is capable of reproducing the best offspring." Those years in the life of the medical or dental student are the years in which he is struggling to obtain his higher education or build up a practice so that he will be self-supporting. As a result of this, every year added on to the medical or dental curriculum is added at the expense of the physiologic life and reproduction, as studied from the standpoint of eugenics.

Another point of interest: When a man or woman spends time in securing higher education they seem to demand more and more of life's luxuries and have not the time, inclination, or desire, to make the sacrifices, socially or otherwise, necessary when rearing a family. If the present standards of education are maintained or are exceeded, as time goes on, we may find that men and women may be so highly educated as to obliterate their usefulness in the improvement of the human race.

A curtailment of the present curriculum of studies would allow a man to get started at his chosen life's work at an earlier age than is now the case and perhaps much benefit might be derived therefrom.

#### ELECTRO-STERILIZATION OF ROOT-CANALS.

Dr. L. E. Custer, of Dayton, O., has some very useful suggestions for the sterilization of root-canals so as to avoid extraction of teeth around the apices of which pus may have gathered. He would have us depend upon our own careful diagnosis of the conditions rather than submit tamely to the medical man's decree for wholesale removals. In support of his plea he says: "If for years the surgeon has been successful in sealing into man's anatomy a piece of boiler-plate the size of a person's hand, and if he can weave twenty or more feet of silver wire into him, or if the soldier returns from the war practically waterlogged with lead bullets which he carries without serious inconvenience the rest of his life, is it not time that the dentist should be able to seal so small a thing as the apical foramen in a manner acceptable to nature? The answer lies alone in asepsis and good root filling." So much for the problem. Now for the preferred solution.

Electricity is used as an aid to sterilization, but says Dr. Custer, "it is not electricity itself which sterilizes, but it is one or a combination of the three processes that go on simultaneously when a current of electricity is caused to flow through a liquid or semi-liquid conductor.



These processes are all co-related and yet are quite different. First, we have electrolysis, in which the liquid is decomposed. Second, we have ionization, which is a step further than simple electrolysis. The solution is not only decomposed, but is split up with respect to the electropositive and negative character of the two bodies which we now call ions. These ions are charged respectively positive and negative, and move towards poles of opposite polarity where they unload their electric charges. It is by the splitting up of the liquid into ions that a liquid is able to conduct electricity. And the third phenomenon is cataphoresis, in which, under certain conditions, the fluid is caused to travel bodily from one pole to the other without suffering decomposition."

It is a much-mooted subject as to which of these foregoing processes really brings about the process of sterilization, and we shall have to assume that the current passing through any liquid or semi-liquid which is a good conductor, tends to destroy bacteria.

The earliest records of the attempt to apply this method to dentistry dates back to Dr. Rhein. Of his method Dr. Custer says: "He used a pure zinc wire for the electrode in the tooth, and with this he used principally pyrozone. When an apical abscess was present he forced the zinc wire entirely through the apex, depending upon the electric action about the zinc wire alone to break up the abscess; and he claimed remarkable results from this procedure. I wish to impress upon you his extreme faith, not only in the use of a zinc wire with some such agent as pyrozone, but in the wire alone at the apical foramen. But, unfortunately, he finishes the operation by filling the pulp canal with gutta-percha."

Dr. Custer has adapted and extended this technique in his own method. (For a full report of same refer to *The Dental Record* of November, 1918.)

He uses a cataphoric outfit for the work. In this the two electrodes are close together so that the fluctuating current is less liable to be felt by the patient. The negative electrode is placed opposite the root to be treated. It is made from a stiff wire about the size and shape of a lady's hairpin, and having a soft rubber polishing cup on either end. It is held in position on the alveolus simply by reason of the tension between the two cups. Each cup is filled with a fresh cotton pellet saturated with salt solution. The positive pole consists of a zinc cone, which later on may be used in filling the pulp canal. The solution used has to be carefully selected if suitable results are to be obtained. Dr. Custer recommends Dakin's solution for use in the root canals or a few drops of alcohol, which, not being an electrical conductor, is made so by the addition of a few crystals of common salt.

As to the technique: "The solution is placed in the root-canal, and the positive electrode is introduced just far enough to make contact



with the solution which will be shown on the ammeter. Do not yet force the cone to the apex, for then the principal effect will take place in the apical region. What we want is to sterilize the dentine. Increase the voltage until the patient feels it. Now what happens? Simply this: two processes are going on in the pulp canal at the same time, namely, electrolysis and cataphoresis. Part of the solution is decomposed, liberating nascent chlorine, a decided germicide, and part is cataphorically carried into the tubuli and part through the apex. This procedure is to be kept up until the zinc cone, following up the evaporation of the solution, reaches almost to the apex of the root and the ammeter has returned to zero or thereabouts. This indicates that the solution has disappeared. Part has been driven into the dentine, part through the apex and part has passed into a gas. If now the zinc cone is forced through the apex the ammeter finger will suddenly swing some points to the right." It is possible, points out the author, to find out in this way the true length of a root canal, the measurements being vastly more accurate than those obtained by the most careful x-ray pictures.

After thorough sterilization of the canals it is necessary to fill them. The ordinary plastic materials such as chloro-percha and resin solutions will not do because of their shrinkage. It is best to use some substance which will harden, not by evaporation but by crystallization. Oxy-chloride of zinc answers this purpose very well. Ordinary oxy-chloride of zinc will not conduct electricity, but may be made to do so by mixing with the oxide powder about equal parts of metallic zinc. This mixture is worked into the canal and is followed by a zinc cone (metallic) which is allowed to remain in the root canal as part of the filling. If the oxy-chloride of zinc sets too quickly for use in the filling of the canals, add a little borax to the liquid.

Now, if an abscess should develop about the root of a tooth filled with the oxy-chloride of zinc, together with the powdered zinc and metallic zinc cone, it is possible to quickly sterilize the area without removing the root-filling, because the electrode is already in place in the canal. The use of zinc is preferable to that of copper or silver, because it does not cause any discoloration to the tooth substance.

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SOMETHING NEW IN PLATE REPAIR.—To replace a broken bicuspid select a porcelain crown to fit the case, and with an engine bur fit a seat for the crown. Now, with a drill, make a hole running up into the rubber on the buccal position of the plate, bend the post to fit, and cement in place. Most plates are thick enough for this kind of repair of all teeth but the molars. Molars can be repaired by using the diatoric teeth, seating the same as above, and using small nickel plated wood-screws, which can be bought at any hardware store, as posts.—G. B. Speer, *Dental Summary*.



## Compulsory Health

### INTEGRAL PART OF SOCIAL RECONSTRUCTION AFTER THE WAR THE RECONSTRUCTION OF THE RACE.

**S**PEAKING before the National Education Association at its Pittsburg meeting, on the subject that we use as our title, Dr. Frederick Peterson, of New York, recently drew attention to the fact that the selective draft in the United States has revealed defects in an average of nearly 30 per cent of young men—the school children of yesterday. When we ask what was the matter with the schools of yesterday, we find the answer, he says, in the school children of to-day. Through them and on them our plans for the reconstruction of the race must act, and he gives us a definite programme for carrying it out. Dr. Peterson's address is of interest to all thoughtful citizens. He says:—

“Authorities show us that there are physical defects in 75 per cent of the 20,000,000 school children of to-day, most of them preventable and remediable, heart and lung diseases, disorders of hearing and vision, malnutrition, diseased adenoids and tonsils, flatfoot, weak spines, imperfect teeth—and among them one per cent of mental defect. The children in country schools are worse off than in city schools. We are sending the best we have to foreign battlefields. We are retaining the 30 per cent of imperfect citizens to leaven the race of to-morrow. There is such a thing as prepotence of inferiority. It is often said that we get what we deserve in the way of government, laws, and institutions. Since it is possible in our democracy for a mormon to be elected mayor of a city and an imbecile to be made governor of a vast State, it may be easily imagined how the smaller offices in our legislatures, county boards, and city councils overflow with the inferior and the unfit.

“We have spent millions of dollars on swine plague, foot-and-mouth disease of cattle, pine blister, chestnut blight, gipsy moth, chicken cholera, and we have that annual ‘pork-barrel’ of millions on millions of dollars devoted to all sorts of trivial and foolish exploitations of rural creeks and hamlets; but what have we spent on our greatest national asset—the health of body in our school children? Body is the foundation on which mental structure must rise. It is of the first importance that the physical foundation be made and kept sound and strong. The mental structure is secondary to that. We are spending enormous sums on medical care of our insane and other defectives in institutions all over the country, and rightly so, to do what we can to repair our broken adults. This is relief work; but what we spend on preventive measures, on health education for our growing children, is, indeed, small by comparison.



"Compulsory education we have—compulsory feeding and training of the mind. Compulsory health we must have—compulsory feeding and training of the body.

"In the war against ignorance we have conscripted the school children. They are the vast draft army of our second line of defense. But in what sort of cantonments do we house them? What physical drill do we give them, what medical inspection and care, what sanitation, what remedial steps do we take to restore them quickly to the ranks when they are ill?

"But enough of destructive criticism. Let us turn to the idea of reconstruction of the race. Let us read the old books with a new comprehension. It is almost a hundred generations ago that a teacher (Mencius) wrote: 'The root of the empire is in the State. The root of the State is in the family. The root of the family is in the individual. So for the people—encourage them; lead them on; rectify them, straighten them; help them; give them wings!'

"We must set up a standard. It might be that of Dr. Oliver Wendell Holmes, 'to begin the education of the child a hundred years before it is born.' That can be attained in a few generations. To accomplish it, we must coordinate all the organizations now at work for the conservation of our citizenry—the maternity classes, the baby-saving societies, the mothers' committees, the kindergartens, the child welfare and physical training bodies, the seaside and countryside and sunshine associations, all that have to do with preschool welfare, the public and private schools, the Child Labor Committee, the Mental Hygiene Association, the boards of education, and the boards of health. The presidents of boards of education should be *ex-officio* members of these coordinated boards. This is a great undertaking, but we can begin by breaking into the curriculum of the public schools and establishing education in health, especially in food-knowledge and food-habits as a vital and essential part of the teaching. From the schools the health instruction will be carried home to the parents and younger children, and soon the whole movement of reconstruction will permeate the state."

Dr. Peterson next outlines his programme for reconstruction, which is a large one, with several requirements as follows:—

"1. The teachers themselves should be given better sanitary conditions for their own health and fuller instruction in all that has to do with the laws of health.

"2. Every city and country school should be made sanitary and kept so, and the school and its grounds should be as beautiful as possible, not only for the benefit of the teachers and the pupils, but as an example to all other citizens who are beginning to use the school more and more as a community center.

"3. Every child should be regularly weighed, measured, and examined and a health record kept, which should accompany him



throughout his school-life. It should be the duty of the authorities to see that the defects of our young citizens are corrected and disorders of growth and nutrition remedied. As malnutrition is one of the most serious conditions, a hot luncheon should be made available for every child and every teacher. The health examination should include dental inspection and treatment.

"4. Each school should have an adequate provision for physical training, gymnasiums, athletic fields, playgrounds, gardens, and shops, together with specially qualified instructors in physical training and other vocational fields.

"5. Finally, with the foregoing foundations there should be a thorough system of instruction in all matters pertaining to health with special emphasis on health problems rather than on disease, in physical and mental habits, in personal hygiene, in public health and sanitation, in methods to avoid communicable diseases, in the responsibilities of parenthood, and in all that relates to nutrition and growth, including foods and food values.

"This is a large programme, too large for the inequalities of consciousness of our multitudinous States. It might be carried out in a few States soon and in others only after generations.

"This is a scheme for the reconstruction of the whole people. It is a Federal programme."

**LOCAL ANÆSTHESIA.**—In minor operations the pressure induced by the hypodermic injection of sterilized water is often successful in producing local anæsthesia.

## Ontario Dental Society

| RECEIPTS.                                              |            | EXPENDITURES.                                                            |            |
|--------------------------------------------------------|------------|--------------------------------------------------------------------------|------------|
| Balance from last year...                              | \$774.00   | Printing, Postage, Stationery, Convention Hall Rental, Essayists, etc... | \$1,100.60 |
| Registration Fees, Luncheon Tickets and Exhibits ..... | 1,658.25   | Oral Hygiene Committee Grant .....                                       | 200.00     |
| Bank Interest .....                                    | 8.42       | Angus and Stonehouse Reporting Convention Luncheon Y.M.C.A. ...          | 88.75      |
|                                                        |            | Convention Luncheon Y.M.C.A. ....                                        | 84.00      |
|                                                        |            | Balance in Bank .....                                                    | 967.32     |
|                                                        | <hr/>      |                                                                          | <hr/>      |
|                                                        | \$2,440.67 |                                                                          | \$2,440.67 |

This statement is in accordance with the books of the Ontario Dental Society, which we have this day audited.

R. G. McLEAN,  
F. C. HUSBAND,  
Auditors.

3rd October, 1918.



# ORAL HEALTH

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Entered as Second-class Matter at the Post Office, Toronto. Subscription Price: Canada, \$1.00; Other Countries, \$1.25; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items and other Correspondence should be addressed to the Editor, Oral Health, 269 College St., Toronto, Canada.

Subscriptions and all business communications should be addressed to The Publishers, Oral Health, 269 College St., Toronto, Canada.

Vol. VIII.

TORONTO, DECEMBER, 1918

No. 12

## EDITORIAL

### Rural School Dental Inspection

THE Oral Hygiene Committee of the Ontario Dental Society held a conference a few weeks ago with the Honorable The Minister of Education, Province of Ontario, and urged the immediate organization of a State School Dental Service as one of the most important and most imperative of the after-the-war state social services demanding attention.

It was urged upon the Minister that the important urban centres of the Province had already established School Dental Clinics, and that the organization of a rural service depended largely upon Government action and assistance. The preventive and educational phases of the question were also discussed, and it was agreed that these should be given emphasis in any plans that were developed.

Regarding the question of free dental service for those children whose parents could not afford to pay for dental treatment through the regular channels, the Committee suggested the desirability of there being established a dental service in every hospital in the Province; and that when such services were established upon the same basis as other hospital services the Government could rely upon members of the dental profession accepting hospital appointments and



devoting certain hours each week without remuneration to the dental care of the poor. The Committee considered that in view of the relatively small percentage of people in the rural districts requiring charitable service, and further, in view of the preventive character of the work to be undertaken in the schools, dental treatment for the poor could thus be satisfactorily carried on, without expense to the Government, through the co-operation of the hospitals and members of the dental profession working through hospital services to be established.

The preventive and educational work to be undertaken by the Government was tentatively stated as follows:

First.—Dental examination of every school child by Government dental officer at least once a year.

Second.—Notification of parent in all cases where defects were found.

Third.—Follow-up work to be undertaken by the school teacher, and credit given child for completion of treatment and proper daily care of the mouth.

Fourth.—Class room instruction on the subject of oral hygiene.

Fifth.—Public lectures, mothers' meetings, press notices, and other educational propaganda to be undertaken in district, concurrently with examination of scholars' teeth.

Sixth.—The establishment of a course of instruction in oral hygiene in all of the Normal, Teacher Training Schools of the Province.

To inaugurate this work the chief school inspector of the province estimated that at least three dental officers, one chief officer and two assistants would be required to undertake this important work.

Such a plan, with modifications as circumstances might dictate, appears to be a most practical way of securing the co-operation of the Government and the dental profession in the solution of the dental side of the rural school health problem. As the total expense involved is comparatively small, early action upon the part of the Government may be looked for.

**DENTAL OPERATIONS PERFORMED BY OFFICERS OF THE CANADIAN ARMY DENTAL CORPS IN ENGLAND AND FRANCE FROM JULY 1st TO SEPT. 30th, 1918, AND ALSO SHOWING GRAND TOTAL OF WORK COMPLETED SINCE JULY 15th, 1915.**

Headquarters, C.A.D.C.,  
Room 45, Pembroke House,  
133 Oxford St., London, W.I.  
Oct. 28th, 1918.

| Total operations reported to:— | Fill-ings. | Treat-ments. | Den-tures. | Prophy-laxis. | Extrac-tions. | Devital-izing. | Totals.   |
|--------------------------------|------------|--------------|------------|---------------|---------------|----------------|-----------|
| June 30th, 1918, .....         | 741,738    | 286,620      | 136,521    | 133,008       | 450,127       | 73,952         | 1,821,966 |
| July, 1918 .....               | 35,644     | 17,572       | 5,283      | 8,082         | 17,329        | 2,791          | 86,691    |
| Aug., 1918 .....               | 32,931     | 11,218       | 5,402      | 8,334         | 16,824        | 2,237          | 76,946    |
| Sept., 1918 .....              | 33,783     | 11,953       | 5,058      | 10,360        | 14,143        | 2,389          | 77,686    |
| Grand total ..                 | 844,096    | 327,353      | 152,264    | 159,784       | 498,423       | 81,369         | 2,063,289 |

J. ALEX. ARMSTRONG,  
Colonel,  
Director of Dental Services  
O.M.F. of C.







